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# CONTRIBUTIONS TO BOTANY,

ICONOGRAPHIC AND DESCRIPTIVE.

BY

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VOL. III.

CONTAINING

A COMPLETE MONOGRAPH

OF THE

MENISPERMACEÆ.

WILLIAMS AND NORGATE,

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## P R E F A C E.

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THIS volume, the result of the labour of many years, forms a complete Monograph of the extensive order of the *Menispermaceæ*, the structure of which was almost unknown when the subject first attracted my attention. This investigation was commenced in 1837, during my residence in Brazil, and was resumed at intervals after my return home, as opportunities presented themselves for examining collections from other parts of the world. In 1851 (Ann. Nat. Hist. 2nd ser. vol. vii. p. 33) I submitted a general review of the progress made up to that time, and gave an outline of the several tribes and genera into which I proposed to divide the family, giving, in a short summary, the chief peculiarities of the several points of structure on which these divisions were founded; subsequently, having accumulated a sufficient mass of evidence, I commenced in 1864, in the 'Annals of Natural History,' the publication of the contents of this volume, where, at intermittent periods, the results of my investigations were chronicled. The difficulties attendant on the acquisition of this amount of information were very great; for, as it was impossible to borrow collections, it became equally impracticable to compare, side by side, specimens at a distance from one another, and my only alternative was to make a tracing of every specimen that came beneath my observation, noting upon each its peculiar features,—a tedious process, but the only one that could enable me to ascertain the characters upon which a valid species was determinable. By this method were accumulated upwards of 700 tracings of *Menispermaceous* plants; and

these were accompanied by a far greater number of analytical dissections of nearly every flower or fruit that came under my notice. This vast amount of original evidence stands as a justification for the contents of this volume: it has all been collected and classified under the present arrangement and brought together in four volumes, which will be deposited in the botanical department of the British Museum, so that it may be accessible to all who may be desirous of investigating the subject. These tracings have been obtained from plants now existing in the Hookerian Herbarium at Kew, in that of the British Museum, in the Wallichian Collection belonging to the Linnean Society, in the Herbarium of the Museum at Paris, in the private collections of Prof. De Candolle, of M. de Boissier, of M. Delessert, of the late Dr. Lindley, and my own Herbarium. I have also preserved in cartouches all the dissected parts of the very numerous flowers and seeds examined; so that I have been able to look over the same again and again, with the object of ensuring the utmost possible accuracy.

In the introduction, the general structure of the family is explained, as well as the peculiarities which clearly serve to separate it into distinct tribes, and to mark the limits of the 63 genera into which the order is here divided. The characters of each genus are amply detailed; and the differential features which serve to distinguish each genus and each species from one another are generally stated. These details, including the descriptions of the species, were printed in succession, as before mentioned, at various intervals up to October 1867; but although the whole of the type of this volume was then in print, its issue could not be effected for want of the numerous plates required for its illustration. The execution of this was retarded by the prosecution of the researches terminating the second volume of this work and the completion of its 45 plates, all performed by my own hands, and not issued before the end of 1869. Since that time I have been occupied, in great measure, in preparing the 67 plates for this volume. With the view of expediting this work, I



endeavoured to obtain the assistance of an able botanical artist ; but, disappointed in this respect, I found it easier to depend on my own efforts. Unable, through infirmity, to accomplish this upon stone, as I had formerly done, I gladly availed myself of a new medium employed by Messrs. Maclure, Macdonald, and Macgregor, the eminent Lithographers, called their autotype process, by means of which I executed all my drawings, which were then transferred by them upon the stones. Some of these are not so successful as others : none can claim the merit of artistic productions ; for there has been no attempt to imitate the more graceful outlines of living plants, as a professional artist would have done ; they are only what they claim to be, mere outlines traced from stiff dried specimens, of which they are correct representations, perhaps not less useful on that account to botanists in a practical point of view.

On looking over the printed matter, I found many typical errors and omissions, for which some excuse may be pleaded from the desultory manner in which the work was printed at distant periods ; and in claiming indulgence on this score, I request the reader to make the indicated corrections, to which is added some new matter that appeared after the work was in type. The index has been made as complete as possible, so as to give the names of all the species mentioned in different botanical works, of which many are now reduced to synonyms ; so that it will be easy to refer each of these to its proper place, as shown under the present arrangement.



## CONTRIBUTIONS TO BOTANY.

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### MENISPERMACEÆ.

IN 1851 (Ann. Nat. Hist. ser. 2. vii. 33) an outline was given of the results of a careful examination of the *Menispermaceæ*, which I had completed three years previously: the object of that sketch was to call the attention of botanists to the subject, and to solicit the aid of better materials for the elucidation of some of the genera, which I had not been able to examine. During the long interval since elapsed, the addition to our knowledge on this subject has been small; and this is one reason why the idea of making a complete monograph of this little-known extensive family, as at first contemplated, has been renounced. But as the principal facts relating to this inquiry remain yet unpublished, it may be useful to give in succession some further details of my previous investigations; and with this view I now proceed to offer some prefatory remarks on the general structure of the order.

The *Menispermaceæ* are generally marked by an external aspect by which, even in herbaria, they are instantly recognized. With rare exceptions, they are all scandent plants, with twining stems, which are often of immense length, presenting a wood of considerable toughness: this has a coarse porous structure formed of radiating segments connected together by walls of dense ligneous tissue, thus bearing some analogy to the *Lardizabalaceæ*, *Nepenthaceæ*, *Aristolochiaceæ*, *Piperaceæ*. &c. On this account, many years ago, Professor Lindley separated these families from

Exogens, under the name of Homogens, the leading feature of which was then believed to be, that, "instead of their wood being formed by zone after zone, season after season, as is the case in the great mass of Exogens, they never have more than one zone of woody matter, to whatever age they may have arrived." This conclusion was, however, soon abandoned, as the existence of more zones than one was fully proved. I have frequently seen several annular rings in the stems of *Menispermaceæ*; and Gardner found one, in Ceylon, in which he counted more than forty distinct concentric zones; but such instances are comparatively rare. It would be needless to detail the structure of the wood in this family, as the subject has been ably demonstrated by Decaisne and others, and as there is little novel information to offer respecting it.

The leaves in the plants of this order are constantly alternate, petioled, and always without stipules; but in many cases the petiole, finally deciduous, is articulated upon a prominent pulvinate cup, on the upper margin of which, adjoining the stem, is seen a budlike process, appearing as if a pair of stipules had embraced the cup, and had become agglutinated to it and the stem: this must not be confounded with the gemma of a nascent branch or flower-stem, which in most instances is supra-axillary. In the genus *Antizoma*, the pulvinate process just mentioned, at its articulation with the petiole, is elongated in the form of a spur, so that it bears the appearance of a short spine. The petiole is often much swollen and tortuous at its base, and, being suddenly bent back, it performs the office of a tendril in supporting the young climbing branches. Its insertion into the blade of the leaf is either peltate or palate. In the former case the point of union is never quite central, but always more or less excentric, sometimes approaching the margin, where the leaf is more or less truncated or cordate. The palatte insertion, however, is more frequent, when the petiole, at its junction with the midrib, often subtends a considerable angle with the plane of the leaf, and is commonly much swollen at that extremity by an enlargement which the French botanists call a *bourrelet*. The leaves vary greatly in form, substance, and texture, and have generally, but not always, three, five, or more nerves springing from the point of insertion of the petiole: they are generally entire on the margin, but sometimes are sinuous or distinctly lobed, more rarely sinuately dentate, or cleft into palmate segments, or (in *Burasaia*) divided into three sessile leaflets on the summit of a long petiole.

The inflorescence varies in different genera, being chiefly axillary, with one or several racemes, more or less simple, growing from a point a little above the origin of the petiole: the



pedicels are sometimes branched, when the inflorescence becomes somewhat paniculate; at other times the flowers are condensed into globular heads upon the peduncle; sometimes the axillary flowers appear in fascicles of pedicillated single flowers, or are simply umbellate, or in umbels compounded to the second or third degree. I have frequently observed the racemes growing abundantly on the stems devoid of leaves. The flowers are generally furnished with bracts; they are extremely minute, and, though often hairy, are sometimes destitute of pubescence: they are, with very rare exceptions, universally unisexual and dioecious. They are said to be sometimes monœcious; but this appears doubtful. In the two instances recorded by DeCandolle, I found, by an examination of the original specimens, that they were decidedly dioecious. St. Hilaire records the existence of a monœcious species of *Cissampelos* (*C. monoica*): this has not been confirmed by any other observer, and is the only instance on record. I have, however, seen two cases where the flowers are distinctly hermaphrodite, or, rather, polygamous. I have observed, in *Anomospermum*, a solitary ovary in the male flowers in a few instances; and I found it a general feature in a specimen of *Tiliacora* from the island of Ceylon.

The arrangement of the floral envelopes (sepals) is usually in several ternary imbricated series, gradually decreasing outwards, the two internal whorls being in most instances considerably larger than the others; and they probably constitute the true normal number of six sepals; and all the outer ones, frequently very minute in size, may be considered as bracts. These six sepals, though in æstivation generally in two imbricate series, are fixed in a nearly circular whorl around a small central torus; but sometimes as many as five ternary whorls are seen arranged, one above another, upon a cylindrical gynæcium, as in the *Magnoliaceæ*. The number in each series is generally three, though sometimes four, five, or six occur: in *Anamirta* and *Quinium* we have a pentamerous arrangement; in *Antitaxis* the floral parts are disposed in opposite pairs, while in *Antizoma* we have the remarkable instance of two opposite sepals hooding two petals placed before them: rarely, as in *Rhaptomeris*, owing to the confluence of the margins of its six sepals, the calyx is gamophyllous, being quite tubular and campanulate. In *Synclisia*, according to Mr. Bentham, the sepals are somewhat united at base into a very short tube; while in *Stephania* and *Cyclea*, although the sepals remain distinct, they assume, by their erect position and approximated margins, the semblance of a tube. The æstivation of the sepals, although in most cases imbricate, is sometimes valvate, as in the cases last mentioned: this occurs in *Tiliacora*, *Abuta*, and *Limacia*. The symmetry in the arrange-

ment of the floral envelopes, though generally similar in both sexes, does not exist in *Cissampelos*, *Cyclea*, *Clypea*, *Antizoma*, and *Stephania*, where, in the female flowers, many of the parts are wanting, being sometimes reduced to a single sepal and only one minute petal, while the male flowers exhibit the usual number of sepals.

The petals, usually six in number, are in the form of small scales or fleshy leaflets originating from the torus. Little notice was taken of them formerly, as they were looked upon as a mere nectary; but they are now universally regarded as real petals, though of minute size; in some few instances they are entirely wanting, as in *Anamirta*, *Coscinium*, *Abuta*, *Anelasma*, *Batschia*, *Trichlisia*, *Syrrhonema*, and sometimes in *Calycocarpum*: in *Fibraurea* they are apparently deficient, but are probably confluent with the filaments, seemingly as if wrapped round them: in many of the genera the petals, though quite free, are found, in a similar manner, with their margins involute and embracing the filaments.

The stamens, especially in the male flowers, by their form and position, afford constant and valid characters; they are usually equal in number to the petals, opposite to them, and generally in two distinct approximated whorls. In most instances they are all quite free; but sometimes the three outer stamens are free, while the others are partially monadelphous in the centre; at other times they are all more or less compactly united into a simple central column. They are usually as long as the petals, frequently double their length. The anthers are generally two-lobed, the lobes being often separated by a connective, which is continuous with the filament; sometimes they are combined together without the intervention of any connective, and partially sunk in the apex of the filament, or often approximated and dorsally affixed upon it; generally these lobes open by a longitudinal suture, but they sometimes burst by a transverse, vertical, or oblique fissure. In the *Cissampelos* group, the stamen consists of a single filamentous column supporting a horizontal peltate disk bearing on its margin four, six, eight, or more anther-cells, combined in an annular form, which burst on their outer edge, like the indusium of some ferns. In other cases several anther-cells are combined into a globular mass, and are either sessile on the torus or supported on a central column. In many cases each anther-cell appears bilocellate, owing to a prominent septum that almost or completely divides it. These great varieties in the disposition and structure of the stamens are constant in each genus, and may be trusted as good discriminating characters.

In the female flowers we generally find the same number and

disposition of floral envelopes as in the male; and there is sometimes a similar number of sterile stamens around the ovaria, but in most instances they are altogether wanting. In the centre of the flower the torus rises more or less in a cylindrical form, to the sides of which the sterile stamens, when present, are attached; they are generally free from one another, but are more rarely attached at their base by a short ring that surrounds the more elevated carpophorum. This latter, in some few cases, bears on its summit only a single ovary; but most generally it carries three distinct ovaries, occasionally four, five, or six, or rarely as many as twelve, arranged in a single whorl. These ovaries are generally sessile, but are sometimes borne each upon a stipitate support, that lengthens considerably with the growth of the fruit. The ovary is unilocular in every instance that has fallen under my observation, and never contains more than a single ovule—a character which forms a valid line of distinction between this order and the *Lardizabalaceæ*, *Schizandraceæ*, and *Winteraceæ*.

The growth of the ovary and the development of the ovule, together with the changes produced in the structure and form of the fruit, present excellent and constant characters, that have not been sufficiently attended to. St. Hilaire was the first botanist who devoted any consideration to the subject, when, in describing a species of *Cissampelos* (Pl. Us. tab. 35), he gave a detailed account of this growth, from the period of the impregnation of the ovule to the final perfection of the fruit. According to his view, the ovary, by its excentric growth, gradually curves itself round in the form of a horseshoe, until the two sides thus bent round touch one another, when they become agglutinated together (*se soudent*): it thus assumes an ovoid or subglobular form, and the original apex, indicated by the style, is thus approximated to the base, the two being separated by the septum thus formed, which extends far into the cell, and which is generated by the “deux portions rapprochées et soudées du péricarpe.” The cell, and consequently the seed, thus assume a corresponding hippocrepical shape.

This view, not altogether correct as far as regards *Cissampelos*, wholly fails to explain the changes attendant on the development of the fruit in other cases. Although the ovule, in an early stage, is simply anatropal and attached to the ventral face, at a point somewhat above its middle from the summit, of a linear placenta on the inner angle of the cell, there is always seen upon the corresponding concave margin of the ovule, below the point of its suspension, a thickened and somewhat curved rib, which is probably the indication of the raphe and chalaza: the ovule is now partly free from the placentiferous angle of the

cell, but most generally it becomes at length adherent to it after the excentric growth and apparent duplicature of the ovary. It is incorrect to say, regarding this development, that the two halves of this curvature are brought together till they unite in order to form the incomplete dissepiment in the manner above described. The circumstance which St. Hilaire mentions as the cause of the metamorphosis appears to me, on the contrary, the result of an agency which he has entirely overlooked, and to this source only the apparent duplicature can be referred. My observations tend to the conclusion that it originates in a peculiar expansion and induration of the placenta within the cavity of the cell, to which cause alone is to be attributed this excentric growth of the ovary; for, in those cases where the placenta does not become expanded, no such duplicature occurs. In the instance of *Cissampelos*, cited by St. Hilaire, it may be seen that the linear placenta first protrudes and extends itself at right angles with the side of the ovary, in the direction of the centre of the cell, and that the growth of the pistil on that side is at the same time arrested, in consequence of which the style and the base of the ovary preserve nearly their original distance, while the growing force is all expended on the opposite or dorsal side, thus producing the hippocrepical appearance described. By observing a section of a half-matured seed of *Cissampelos*, the development of the pseudo-dissepiment may be seen distinctly, when the nourishing vessels belonging to the placenta can be traced in the centre of this line of extension, reaching to its extremity, like an imbedded umbilical cord, which is found in the same position after the whole has become ossified. There is no appearance of any duplicature of the pericarpial covering of the ovary, or its subsequent agglutination, as described by the eminent botanist referred to: it will be found to exist only in the endocarpial portion. The development, as I have explained it, is even more evidently demonstrated in the seed-vessels of *Ileocarpus* and *Stephania*, where the hippocrepical cell is formed round a flat, solid, orbicular disk, in the substance of which the nourishing vessels can be traced, as in the pseudo-dissepiment of *Cissampelos*.

In a group which I have called *Heteroclínia*, the growth is somewhat varied: there, in the early stage, the ovule is attached as described in *Cissampelos*; but the placenta, from which it is suspended, is like a broad oval disk upon the inner face of the cell; and while the ovary continues to increase equally in all directions, the increment about the placental space is somewhat less: this face of the cell thus gradually assumes a convex shape inside, and the placenta swells into a globular figure, forming sometimes a hollow prominent chamber within the cavity of the



cell, round which the seed is moulded and becomes fungilliform and attached to it by its short line of raphe and chalaza. In *Odontocarya*, *Jateorhiza*, *Calycocarpum*, and *Aspidocarya*, the inner face of the putamen is nearly flat, or only slightly convex within, the placenta does not swell and form a vacant chamber, and the seed remains suspended from its normal point of attachment,—the raphe and chalaza, more or less free from the epicarp, being clearly manifest along the middle face of the seminal integument. Thus it will be found that the fruit and seed, in the several genera, assume different shapes and degrees of development, to be hereafter detailed, furnishing constant and valuable distinguishing characters.

For the facility of concisely describing the peculiar enlargement of the placenta, which acts so important a part in the development of the putamen and seed, I proposed many years ago to call it a *condylus*, because the seed is articulated upon it as a socket. The use of this term has been objected to (as I think, somewhat hypercritically) by the learned authors of the 'Flora Indica' (p. 169), because they consider it improper to apply specific terms to modifications of structure peculiar to single orders; and they prefer to designate the same as a "processus internus condyliformis putaminis"—a term more objectionable, because more circumlocutory. If the term "condylus" is to be rejected on account of its use in zoological science, then we ought to discard the words "umbilicus, placenta, vagina, vitellus," &c., as well as other designations commonly used by botanists with much advantage, such as "retinaculum, hypanthium, gynophorus, ochrea, rostellum, corona, labellum," and a number of others peculiar to certain orders. I therefore still think it advisable to give a comprehensible designation to that important development which, in the *Menispermaceæ*, offers a good and constant character for generic purposes.

The fruit in the *Menispermaceæ* is drupaceous, of an oval, gibbous, or pyriform shape, consisting of a membranaceous coloured pericarp, sometimes hairy, covering a more or less fleshy mesocarp, and enclosing a solid putamen. When the number of ovaries is three or more, some of them prove abortive and fall off, leaving distinct scars upon the carpophorum to which they were attached. These drupes are sometimes sessile upon the carpophorum; but in other cases the base of each drupe is narrowed and prolonged into a stipitate support, so that there is no immediate contact of the putamen with the carpophorum; in other cases, besides this stipitated support, each drupe is articulated upon a distinct pedicelliform emanation of the carpophorum, as in *Tiliacora*, where it is comparatively short; but in

*Sciadotænia* this emanation becomes elongated in an extraordinary manner: in this case the number of ovaries is constantly nine, uniseriably sessile upon the summit of a columnar carpophorum; in the course of its growth a process is generated beneath each ovary, which becomes elongated in the form of a long pedicel on which the fruit is articulated; so that they bear the appearance of an umbel of nine distinct flowers, each bearing a single seed. This was the inference I drew when I first saw the plant\*; but I was soon afterwards convinced of the true nature of this development, on obtaining a specimen where in some of the flowers eight of the ovaries remained sessile and abortive upon the carpophorum, while only a single fruit was carried up by the pedicel-like expansion of nearly three times the length of the seed. This curious development, which some years afterwards was noticed by Mr. Bentham †, is evidently the growth of the carpophorum, not of the ovary, which is articulated on its summit, and leaves a scar when it falls off, while the pedunculiform expansion remains solidly attached to the carpophorum.

The structure of the endocarp is deserving of some consideration. With few exceptions, it becomes hardened into a firm and often osseous nut, more seldom into a chartaceous putamen, which is sometimes thin and horny. In all the *Leptogoneæ* and *Platygoneæ*, where the cell is curved round a central condylus, the outer rim of the putamen is transversely marked with several broad and deep crenelures; and as the shell is of uniform thickness, the seed becomes indented with corresponding impressions. In the *Heterocliniææ*, where the form of the nut is usually oval or orbicular, the external surface, though sometimes smooth, is frequently covered with tubercular or irregular cristate projections; and sometimes, upon the internal and ventral surface of the cell, across each side, numerous more or less elevated cristate plates project, which enter into corresponding fissures of the albumen, much after the manner seen in the seeds of many of the *Anonaceæ*. In *Odontocarya* and *Jateorhiza*, genera of the *Heterocliniææ*, and in *Hematocarpus* among the *Pachygoneææ*, the putamen is covered with an extremely dense tomentum, formed of innumerable fine simple hairs or fibres which are imbedded in the pulpy mesocarp. In *Anomospermum*, the drupes of which I examined in the living state, the mesocarp consists of a number of fleshy masses, each about a line in diameter, which, by mutual pressure, are somewhat angular; they adhere together with some tenacity, and can only be removed from the putamen by force. A number of cancellated furrows, filled with ligeneous

\* Ann. Nat. Hist. ser. 2, vii. 43. † Journ. Linn. Soc. v. Suppl. p. 51.

fibres, are seen on the surface of the putamen, corresponding with the lines of junction of these gland-shaped masses. After the fruit has become dried, these glands cannot be detected, though the cancellated furrows always remain. Similar cancellated furrows, filled with fibres, are seen on the putamen in *Cosciniun* and *Anelasma*, whence it may be inferred that, in the ripe state, their mesocarp is constituted as in *Anomospermum*.

The seed, in all the Menispermaceous plants that have fallen under my observation, is covered by two thin membranaceous integuments, the inner one being of delicate texture; the raphe is always found on the ventral face of the outer one, in the form of a thickened line of a darker colour; and here generally is seen a thin carinated duplicature of this integument, extending along the whole length of the placenta, and this duplicature enters into a corresponding furrow on the condyle, by which, at the period of maturity, the seed is found attached.

Albumen is present in the genera of all the tribes, except in those of one, where it is altogether wanting. In the tribes *Leptogoneæ* and *Platygoneæ* it is simple and homogeneous; in *Anamirta*, among *Heteroclinaæ*, it is nearly so. In *Anomospermum* and in most of the *Tiliacoreæ*, where the embryo is terete, the thick circumambient albumen is cleft transversely, almost to the centre, by numerous fissures, into which the integument enters, thus producing a ruminated structure similar to that seen in the *Anonaceæ*. In the *Heterocliniæ* the albumen consists of two nearly distinct plates, that on the dorsal face being like a thin simple lamina, while that on the ventral side is much thicker and deeply cleft, as before mentioned, by a number of irregular fissures penetrating nearly its whole depth. In the *Pachygoneæ*, where the albumen is wanting, the embryo occupies the entire space of the cell.

The form of the embryo is various. In all the genera of the *Leptogoneæ* it is slender and terete, with the radicle equal in diameter to the cotyledons, and nearly of equal length, sometimes a very little longer or a little shorter. In *Anomospermum* the embryo is also slender and terete; but the cotyledons, which are coequal in diameter with the radicle, are ten times its length. In *Tiliacora*, where the embryo is of similar form, the cotyledons are only twice the length of the radicle. In all the *Platygoneæ* the radicle is always terete; but the cotyledons are flattened, subfoliaceous, and at least double its breadth, often much broader. Throughout the preceding instances, the cotyledons are adpressed and contiguous, as in ordinary cases, being *accumbent* in the *Pachygoneæ*, *Anomospermeæ*, and *Hypserpeæ*, but *incumbent* in the *Tiliacoreæ*, *Leptogoneæ*, and *Platygoneæ*: these are important distinctions, that merit more attention than they have

obtained. The embryo is of a very different and very peculiar form in all the *Heteroclinieæ*, where the cotyledons are extremely thin, foliaceous, and present the singular anomaly of being widely and divaricately spread on a plane parallel with the external face.

When, after careful study, I first attempted to classify the *Menispermaceæ*, it became manifest, from the foregoing evidence, that the floral parts, always of diminutive size, were little adapted for this purpose; but by adopting as a basis the development of the fruit, it was easy to establish several valid and well-defined groups. An interval of nearly sixteen years has tended to confirm this conviction; and accordingly the same arrangement which I formerly adopted is here repeated, with some modifications, by dividing the family into seven well-marked tribes, in the following manner:—

Tribe 1. *HETEROCLINIEÆ*. The putamen here is generally osseous, rarely chartaceous, somewhat compressed antically and postically, 1-ocular, with an internal umboniform or globular condylus in the middle of its ventral face, which is often divided into two chambers by a partition, to which the more or less meniscus-shaped seed is attached in the manner before mentioned, the line of the raphe with a portion of the integuments being drawn into this partition, from which it is difficult to detach it. But sometimes the condyle entirely vanishes in a mere umboniform depression of the ventral face of the nut, correspondingly convex within the cell, the seed being suspended from near its summit by a mere point or extremity of the raphe which is seen continuous upon the free integument, running down its ventral face: this modification occurs in *Calyccarpum*, *Jateorhiza*, *Fibraurea*, *Parabæna*, *Aspidocarya*, and *Odontocarya*. It should be mentioned, as a general character of the tribe, that the remnant of the style is always seen near the summit of the drupe, or comparatively little removed from it. The embryo is consequently nearly orthotropous, with large foliaceous cotyledons placed laterally and divaricately on the same plane, and imbedded in distinct cells of the albumen, which is thin and homogeneous on the dorsal side, always thicker on the ventral portion, which latter is most frequently deeply cleft or ruminated by numerous fissures, as in *Anona*, the radicle being short, terete, and superior.

Tribe 2. *ANOMOSPERMEÆ*. Here the style is on the apparent summit of the drupe, whose stipitate support is on one side of the longer diameter of the fruit, so that the style is more or less excentric to the real base of the drupe, which, properly speaking, is transversely or obliquely oval and gibbous. The putamen is coriaceous, and the seed is quite cylindrical and straight for



two-thirds of its length, and more or less uncinately curved at its base. In both cases the seed is folded upon a perpendicular internal laminiform condyle, which protrudes from the ventral face of the putamen nearly to the centre of the cell, where it terminates in a longitudinal placentiferous margin; the copious albumen which fills the cell is deeply ruminated in all directions by numerous clefts; the integuments penetrate these clefts, and also cover the deep longitudinal groove formed by the projecting condyle, to the placentiferous margin of which they adhere along the line of the raphe. The embryo is nearly anatropous, a little bent or partially heterotropous, very slender, terete, and elongated, with cotyledons of the same diameter as the very short terete radicle, which is quite superior and only one-tenth of their length: these are accumbent, and placed on the axis of the albumen. The sepals are imbricated in æstivation, and the free fleshy petals separately embrace and almost conceal the stamens.

Tribe 3. *TILLACOREÆ*. The drupe is so extremely gibbous that the style is seen near the base of the fruit. The putamen is transversely oblong, laterally compressed, sulcated by a central line along the middle of each face, and rendered bimar-supiate by a long, horizontal, septiform, internal condyle; the cell (and therefore the seed) is hippocrepiform; the albumen is deeply cleft or ruminated, as in the last tribe, the integuments penetrate its sinuosities, and they adhere to the condyle along the line of the raphe. The embryo, which lies in the centre of the albumen, is elongated, hippocrepiform, and nearly terete; the radicle, pointing to the style, is of the diameter of the cotyledons, and about equal to them in length; they are always incumbent (not accumbent, as in the former tribe). The sepals of the inner row are slightly imbricated in æstivation in some genera, and valvate in others.

Tribe 4. *HYP SERPEÆ*. The style here also is seen near the base of the fruit, in consequence of its excentric growth. The putamen is formed as in the preceding tribe, and the embryo, imbedded in simple albumen, is of the same slender proportions; but the cotyledons are accumbent (not incumbent). The sepals in æstivation are either imbricated or valvate, and the flowers are sometimes remarkable for being very unsymmetrical in the relative number of their parts.

Tribe 5. *LEPTOGONEÆ*. The growth of the fruit is as excentric as in the last tribe, so that the style is always seen near the base. The putamen is generally osseous, nearly orbicular, laterally very compressed, forming a crescent-shaped or nearly annular cell circumscribed round the edge of an external peltiform condyle, a portion of the integuments along the line of the raphe being drawn into a fissure of the condyle.

The embryo partakes of the cyclical form of the cell, is slender, elongated, and terete, with incumbent cotyledons (not accumbent as in Tribe 2), equal in thickness and length to the terete radicle, the whole being imbedded in the middle of simple albumen; the radicle at the extremity of the upper horn points to the style. The sepals are imbricated in æstivation. In one section of the tribe (*Cissampelidæ*) the number of floral parts is greatly reduced in the female flowers.

Tribe 6. *PLATYGONEÆ*. The style here also is near the base of the fruit. The putamen either resembles that of the *Tiliacoreæ* in shape, divided by a septiform condyle, having a hippocrepiform cell, or the condyle is subglobular and often 2-camerate, variously perforated, to the edge of which the integuments are attached, as in the two last tribes, the cell being in this case cyclical. The seed is either 2-crural or cyclical; the embryo is imbedded in the middle of the albumen which fills the cell, partakes of its form, has large incumbent cotyledons, as in the *Leptogoneæ* (not accumbent); these are flattened and foliaceous, twice or three times the breadth of the more slender terete radicle, and always from two to six times its length; the radicle in the upper horn points to the style. This is a very natural and well-marked division, and ought on no account to be confounded with the two former.

Tribe 7. *PACHYGONEÆ*. The style, as in the three former groups, is near the base of the fruit, or it is more removed from it. The putamen is generally coriaceous, with a septiform condyle, which is sometimes almost obsolete. Unlike all the other tribes, the embryo is here quite exalbuminous, so that it entirely fills the cavity of the hippocrepiform or reniform cell, the radicle being extremely short and small, pointing to the style, the cotyledons being very large, extremely fleshy, cyclically curved and accumbent. These characters render it one of the most natural divisions of the family.

The authors of the 'Flora Indica,' in their arrangement of Asian *Menispermaceæ* (in 1855), were the first to adopt the principle of the above distribution; but they made several objectionable alterations in it, losing sight of some of the more prominent and constant characters, and adopting others of less value. They divided the family in a somewhat different manner, some of their groups being extremely heterogeneous. Their first tribe (*Coscinieæ*) offers no character different from my *Heteroclinieæ*; the latter was adopted by them as their second tribe, but they changed its name to *Tinosporeæ* without any advantage; the former designation certainly better expresses the very peculiar and most salient character of the group—that of their divaricated cotyledons imbedded in distinct cells of the

albumen. Their fourth tribe consists of my subdivision *Cissampelida*, which they separated from the rest of my *Leptogonea*. They abolished my tribe *Tiliacoreæ*, which offers such distinct characters, and united the only Indian genus belonging to it with the rest of the *Leptogoneæ*: these, together with my *Platygoneæ*, constituted their third tribe, *Cocculæ*—a name especially objectionable on account of its old association with *Anamirta Cocculus* (the *Cocculus* of commerce), and thus likely to lead many persons into error: in this group different forms of embryo are mixed together, and the important distinctions between accumbent and incumbent cotyledons are totally disregarded. Their fifth tribe is adopted upon my *Pachygoneæ*, with little alteration.

Messrs. Bentham and Hooker, in their 'Genera Plantarum,' published a few months ago, have followed in the steps of the authors of the 'Flora Indica,' but have avoided some of their errors, and properly discard the *Coscinææ*; they have, however, followed the same principle of distribution. They adopt my *Heterocliniææ* (under the name of *Tinosporeææ*) as their first tribe, and my *Pachygoneææ* as their fourth tribe; they also separate my subtribe *Cissampelidææ* from the rest of the *Leptogoneææ* as their third tribe; while for their second tribe, under the objectionable name of *Cocculææ*, they confound together my *Anomospermeææ*, *Tiliacoreææ*, the remainder of the *Leptogoneææ*, and all the *Platygoneææ*, thus mixing up heterogeneously opposite conditions of albumen, and different forms of embryo, and totally disregarding the important distinction of accumbent and incumbent cotyledons—characters fully appreciated by them in other families. This, no doubt, has been done with a view to concentration; but it cannot be denied that it is effected at the sacrifice of consistency. It appears to me that, if we profess to adopt a principle as a basis of division, it should be carried out strictly. The feature of ruminated albumen is too peculiar to be so overlooked; and hence the *Anomospermeææ* and *Tiliacoreææ* are deserving of special places, and should be held distinct, not only because of having quite a different direction of the condyle, but on account of one having accumbent, the other incumbent cotyledons. It is for this latter reason that I have ventured to add a new tribe, *Hypserpeææ*. The marked contrast between the slender thread-like embryo of the *Leptogoneææ*, as contradistinguished from those with foliaceous cotyledons, many times the breadth of the slender radicle, is too important to be passed over; and hence the necessity for maintaining the *Platygoneææ* as a distinct tribe. The differences in floral structure are of secondary importance; and for this reason the *Menispermeææ* and *Cissampelidæææ* have been retained by me as subtribes, and conjoined into a single tribe (*Leptogoneæææ*), in which all the genera are alike distinguished for

one uniform character of embryo. I think, therefore, it will be conceded that my distribution is based on more consistent principles; and I perceive no disadvantage whatever in having as many as seven well-defined tribes, seeing that this is not an uncommon number accorded to other families by the authors of the 'Genera Plantarum.' It will be noticed that the same eminent botanists have changed the names of my tribes, calling them after some particular genus which, as before shown in *Cocculæa*, may be very inappropriate: by this no advantage is gained; on the contrary, it is far better to name a tribe, wherever it can be done, by its principal distinguishing feature, which at once recalls to mind the group to which any plant belongs: thus the names *Heterocliniea*, *Leptogonea*, *Platygonea*, and *Pachygonea*, speak for themselves more readily than *Tinosporeæ* and *Cocculæa*. This method has been extensively followed in that great work the 'Prodromus' of DeCandolle, from which no inconvenience whatever has yet arisen.

In their distribution of the *Menispermaceæ*, the eminent botanists before mentioned annul several genera which appear to me to stand on valid ground: among these they are decidedly in error in excluding my genus *Odontocarya*, not only from the *Heterocliniea*, but from the order altogether, referring it to *Euphorbiaceæ*: its carpological features all conform unquestionably with those of the *Heterocliniea*, and place it in immediate affinity with the genus *Aspidocarya* of the 'Flora Indica.' *Anelasma*, though a very good genus, has been discarded by the same authorities, who have likewise condemned *Batschia*. For these, and some other genera in like manner suppressed by them, the evidence will be given on which they have been maintained.

After mature reconsideration of all the facts relating to the differences in structure in the several genera, I feel bound to adhere to my previous distribution of the *Menispermaceæ*, formed by many years of attentive study and careful analyses. It must be remembered that when this investigation was undertaken little was known of the extremely varied structures in this family—structures resolvable into several well-marked groups; for it is evident that the meagre information previously recorded was based upon a large amount of error, as will be seen by reference to the 'Prodromus' of DeCandolle and Endlicher's 'Genera Plantarum.' It was not till my "Remarks" were published in 1851, that some light began to gleam on the subject; even then a mere outline only was given of the new facts obtained, the details of which remain yet unpublished. These will now be given in succession, and will be afterwards illustrated by some of the numerous drawings made at the time of the examination.

The question of the affinities of the group was considered in my first "Remarks on Menispermaceæ" (Ann. Nat. Hist. ser. 2.

vii. 34) : this has since been so ably discussed by the authors of the 'Flora Indica' (p. 170) that it is unnecessary to go over the same ground, as I concur in most of their views on the subject. The relationship towards *Lardizabalaceæ*, *Magnoliaceæ*, and *Anonaceæ*, as is there shown, cannot be doubted; but this is not so considered in the new 'Genera Plantarum,' where the apocarpous order *Lardizabalaceæ* is transferred as a mere tribe into the monocarpous family of *Berberidaceæ*, and that of the *Canellaceæ* (intimately related to this last family) is carried far away and placed between *Violaceæ* and *Bixaceæ*: this appears to be a very illogical view of their true relationship. The apocarpous *Thalamifloræ*, with parietal placentation, constitute so natural a group, and are connected together by so many similar characters, that it is difficult to conceive why any of them should be placed elsewhere; and, in regard to *Canellaceæ*, the fact of having two or four lines of parietal placentation, as in some *Lardizabalaceæ*, the resemblance of the ovary and seed to those of *Drimys* (especially in the shape and position of their small embryo), their many-seried imbricated sepals and petals (as in *Magnoliaceæ*), their extrorse anthers (as in *Anonaceæ*), the extrorse monadelphous stamens (as in many *Menispermaceæ*), their solitary carpel (as in *Berberidaceæ*), and the resemblance to the whole of these orders in their mode of placentation, are characters extremely manifest\*. The weight of this evidence leads to the conclusion and confirms the opinion that the *Canellaceæ* should rest in contiguity with *Berberidaceæ*, osculating at the same time with the above-mentioned apocarpous group, and not with *Bixaceæ* or *Violaceæ*, with which they have little analogy. If these eminent authorities had classed the *Canellaceæ* where they have placed the *Lardizabalaceæ* (before *Berberidaceæ*), and had retained the *Lardizabalaceæ* in their former position among the climbing polycarpous families, near *Menispermaceæ*, such an arrangement would have met with the general accord of botanists; and this it is to be hoped they will be induced to do in a second edition of their important work.

\* Having lately defined the characters of the *Canellaceæ* (Contrib. Bot. i. 112, pl. 23, 24), I cannot be considered presumptuous in venturing to differ in opinion from the above-mentioned eminent botanists, who acknowledge the resemblance of the seeds to those of *Winteraceæ*, but who object that the *Canellaceæ* differ widely in the structure of the perianth, stamens, and ovary. This can hardly be conceded; for if we compare the sepals and petals of *Cinnamodendron* (pl. 24) with those of *Drimys* (pl. 26) or of *Illicium*, they will be found to accord in a remarkable manner; and if we conceive the extrorse stamens of *Drimys* united by their margins, we have precisely the staminal tube of *Canella*; in like manner, by joining the five carpels of *Drimys* by their margins into one, we have exactly the ovary of *Cinnamodendron* with its sessile stigmata and five lines of placentation, as shown in pl. 24.

With the view of assisting the recognition of the plants of this family, the following synopsis is offered of the distribution of the genera, which will be separately described in the same order.

SYNOPSIS GENERUM MENISPERMACEARUM.

- Tribus 1. **HETEROCLINIÆ.** Embryo fere rectus, cotyledonibus foliaceis, divaricatis, intra locellos albuminis copiosi hinc ruminati inclusis, radícula parva, tereti, supera. Condylus diversiformis, internus, vel fere obsoletus.
- Cotyledones irregul. laciniati; condyl. globos. 2-camerat. .... 1. *Coscinium.*
- Cotyledones integri.
- Stamina libera.
- Stam. 12 (6 inter. longiora); antheræ introrsæ; condyl. umbiform. concav. .... 2. *Calyocarpum.*
- Stam. 6; anther. longit. debisc.; condyl. umbiform. concav. .... 3. *Jateorhiza.*
- Stam. 6; anther. transv. debisc.; condyl. globos. 2-camerat. .... 4. *Tinospora.*
- Stam. 6; filam. dilat. memb.; condyl. globos. 2-camerat. .... 5. *Chasmanthera.*
- Stam. 6; filam. petal. coalit.; condyl. e plica longit. valde intrus. .... 6. *Fibraurea.*
- Stam. 6; filam. clav. incurv.; condyl. e sulco longit. obsolet. .... 7. *Tinomiscium.*
- Stam. 6; filam. brev. incrass. .... 8. *Burasaia.*
- Stamina monadelphia.
- Antheræ 15-40, recept. globos. sessil. coalit.; condyl. globos. 2-camerat. .... 9. *Anamirta.*
- Antheræ 6, in caput aggreg., filam. gracil. suffult.; condyl. umbiform. concav. .... 10. *Parabæna.*
- Antheræ 6, peltat. affixæ; filam. columnar.; condyl. umbiform. obsolet. .... 11. *Aspidocarya.*
- Stamina 6; filam. ad medium coalit.; condyl. umbiform. concav. .... 12. *Odontocarya.*
- Stamina ignota; putamen echinat.; condyl. magn. scutiform. 1-camerat. .... 13. *Rhigiocarya*.\*
- Tribus 2. **ANOMOSPERMÆ.** Embryo tenuis, teres, intra albumen copiosum undique ruminatum inclusus, cotyledonibus accumbentibus, incurvatis aut fere rectis; radícula brevissima, ad summum spectante. Condylus internus, verticalis, lamini-formis. Sepala æstivatione valde imbricata.
- Petala 6, stamina amplexentia .... 14. *Anomospermum.*
- Tribus 3. **TILIACORÆ.** Embryo teres, tenuiter elongatus, hippocrepice curvatus, intra albumen copiosum undique ruminatum centralis, cotyledonibus teretibus, incumbentibus; radícula tereti, iis 2-plo brevior, ad stylum fere basalem spectante.

\* *Rhigiocarya racemifera.* Riv. Quorra (Barter, 3325).

- Condylus internus, horizontaliter septiformis. Sepala aut subvalvata, aut subimbricata.
- Petala 6. Sepala valvata. Stam. glabra. Drupæ 3-12, stipitatae et carpoph. long. suffult. .... 15. *Tiliacora*.
- Petala 0. Sepala valvata. Stam. glabra. Drupæ 3, tomentos. brev. stipitat. .... 16. *Abuta*.
- Petala 0. Sepala valvata. Stam. hirsut. Drupæ 3, tomentos. brev. stipitat. .... 17. *Batschia*.
- Petala 0. Sepala subimbric. Stam. glabra. Drupæ 3, glabræ, brev. stipitat. .... 18. *Anelasma*.
- Tribus 4. *HYPSEPERPÆ*. Embryo teres, tenuiter elongatus, intra albumen simplex cyclice curvatus, cotyledonibus accumbentibus, radícula iis æquilonga, ad stylum fere basalem spectante. Condylus externus, subglobosus.
- Sepala 8-12, inter. imbric. Petal. 5-6-8. Stam. 6-8-10. Ovaria 3-6 ..... 19. *Hypserpa*.
- Sep. 6-9, inter. valvat. Pet. 6. Stam. 6. Ovar. 3 ..... 20. *Limacia*.
- Tribus 5. *LEPTOGONÆ*. Embryo teres, tenuiter elongatus, intra albumen parcum simplex cyclice curvatus, cotyledonibus incumbentibus, radícula iis æquilonga aut 2-plo longiore, ad stylum fere basalem spectante. Condylus externus, globosus, vel peltiformis, varie elaboratus. Sepala imbricata.
- Subtribus 1. *Menispermeæ*. Stamina distincta vel imperfecte monadelphæ.
- ♂ Petala 6 vel 0. Stam. 12-18, libera. ♀ Petala 6 ..... 21. *Menispermum*.
- ♂ Petala 6. Stam. 6, libera. ♀ Petala 6, cuneato-auriculata ..... 22. *Pericampylus*.
- ♂ Petala 6. Stam. 6, basi coalita ..... 23. *Pselium*.
- ♂ ignot. ♀ Petala 3 ..... 24. *Ileocarpus*.
- ♂ ignot. ♀ Petala 4 ..... 25. *Homocnemia*.
- Subtribus 2. *Cissampelideæ*. Stamen 1, centrale; filamentum columnare; antherarum loculi peltatim affixi.
- ♂ Sepal. 4, libera. Pet. 1, poculif. Anth. loc. 4-12, pelt. coalit. ♀ Pet. 1 ..... 26. *Cissampelos*.
- ♂ Sepal. 4, libera. Pet. 1, poculif. Anth. loc. 4, pelt. coalit. ♀ Pet. 2 ..... 27. *Antizoma*.
- ♂ Sepal. 4, valvat. Pet. 4, valvat. Anth. loc. 4-8, pelt. coalit. .... 28. *Clypea*.
- ♂ Sepal. 6, libera. Pet. 3. Anth. loc. 6, pelt. coalit. .... 29. *Stephania*.
- ♂ Sepal. 6, libera. Pet. 6. Anth. loc. 6, pelt. coalit. .... 30. *Clambus*\*
- ♂ Sepal. 8, libera. Pet. 4. Anth. loc. 4, conglobat. .... 31. *Cyclea*.
- Tribus 6. *PLATYGONÆ*. Embryo intra albumen parcum simplex hippocrepiformis aut cyclice curvatus, cotyledonibus foliaceis, incumbentibus, radícula tereti, iis 2-10-plo brevior, ad stylum fere

\* *Clambus araneosus*, Mexico (Pavon).

basalem spectante. Condylus externus, aut septiformis, vel subglobosus. Sepala imbricata.

- ♂ Petal. 6, emargin. imo involut. Stam. 6, distinct. Condyl. globos. 2-camer. ext. perforat. .... 32. *Cocculus*.  
 ♂ Pet. 6, bifid. lacin. acutiss. Stam. 6, distinct. Condyl. globos. 2-camer. ext. perforat. .... 33. *Nepthoica*.  
 ♂ Pet. 6, bifid. lacin. obtus. Stam. 6, distinct. Condyl. globos. 2-camer. ext. perforat. .... 34. *Holopeira*.  
 ♂ Pet. 6, cuneat. auric. ap. dentat. Stam. 6, distinct. Condyl. septiform. .... 35. *Diploclesia*.

Tribus 7. PACHYGONEÆ. Embryo exalbuminosus, hippocrepeice vel cyclice curvatus, cotyledonibus valde crassis, accumbentibus, radícula brevi, tereti, ad stylum fere basalem spectante. Condylus externus, septiformis, vel subglobosus, aut fere obsoletus.

- ♂ Petala 6. ♀ Ovar. 3. Cotyled. hippocrep. Condyl. septiform. .... 36. *Hyperbæna*.  
 ♂ Petala 6. ♀ Ovar. 6. Cotyled. hippocrep. Condyl. septiform. .... 37. *Chondodendron*.  
 ♂ Petal. ignot. ♀ Ovar. 3. Cotyled. hippocrep. Condyl. septiform. .... 38. *Hæmatocarpus*.  
 ♂ Petal. 6. ♀ Ovar. 3. Cotyled. hippocrep. Condyl. subpeltiform. .... 39. *Pachygone*.  
 ♂ Petal. 6. ♀ Ovar. 6. Cotyled. cyclic. Condyl. umbiform. .... 40. *Pleogyne*.  
 ♂ Petal. ignot. ♀ Ovar. 9. Cotyled. cyclic. Condyl. umbiform. Carpoph. elong. .... 41. *Sciadotenia*.  
 ♂ Petal. 0. ♀ Ovar. 3. Cotyled. incurv. radic. gigant. Condyl. obsolet. .... 42. *Triclisia*.  
 ♂ Petal. 6. ♀ Ovar. 3. Cotyled. incurv. radic. minima. Condyl. obsolet. .... 43. *Pycnarrhena*.  
 ♂ Petal. ignot. ♀ Ovar. 3. Cotyled. ignot. Condyl. obsolet. .... 44. *Sarcopetalum*.

Genera incertæ tribus (fructu ignoto).

- Sepal. 9-12. Petal. 6. Stam. 3, ultra med. coalit. 45. *Detandra*\*.  
 Sepal. 6. Petal. 0. Stam. 3, ad med. coalit. Stamina libera. .... 46. *Syrrhonema*†.  
 Sepal. 4, imbric. Petal. 2. Stam. 4. Anth. 1-lob. transv. hiant. .... 47. *Antitaxis*.  
 Sepal. 6, imbric. Petal. 6. Stam. 6. Anth. 2-lob. transv. hiant. .... 48. *Elissarrhena* ‡.  
 Sepal. 12, imbric. Petal. 6. Stam. 6. Anth. 2-lob. connectiv. galeat. .... 49. *Baterium*§.  
 Sepal. 9; 3 coalit. valv. Petal. 6. Stam. 9; 3 lib. 6 monadelph. Anth. 2-lob. diagon. hiant. 50. *Synclisia*.  
 Sepal. 9, imbric. Petal. 6. Stam. 6, Anth. 2-lob. Ovar. 3. Stigm. magn. .... 51. *Penianthus*||.  
 Sepal. 5. Petal. 5. Stam. 5. .... 52. *Quinnum*.

\* *Detandra latifolia* et *ovata*. Both from Bahia (Blanchet, sin. n<sup>o</sup>. et n<sup>o</sup>. 3178).

† *Syrrhonema fasciculatum*. Fernando Po (Mann, 192).

‡ *Elissarrhena longipes*. Rio Negro (Spruce, 1538).

§ *Baterium validum*. Khasya (Griffiths).

|| *Penianthus longifolius*. Fernando Po (Mann, 194).



Genera dubia, vel ab ordine excludenda.

*Adeliopsis*, Bth. & Hook. (Gen. Pl. i. 436). In each of its three carpels there are two superimposed ovules—a character quite foreign to *Menispermaceæ*, and more in conformity with *Schizandraceæ*.

*Spirospermum*, Th. Although admitted in the new 'Genera Plantarum' (i. 39), the genus cannot belong to this order: if the mode of development of the ovary in *Menispermaceæ* be as I have described it (of which little doubt can be entertained), no embryo by any possibility could ever become "cylindricus, longissimus, spiraliter convolutus." This structure recalls to our memory the Sapindaceous genera *Ophiocaryum*, *Llaguoa*, and *Guindilla* (*Valenzuelia*), the latter a dioecious or polygamous plant from the Andes of Chile, having three distinct unilocular carpels, attached to a short slender gynobase, each containing an exalbuminous seed with a spiral embryo. The position of *Spirospermum* will more probably be found in *Sapindaceæ* or *Ochnaceæ*.

It may here be remarked that the *Chondodendron* of the new 'Genera Plantarum' (non R. & P.) is identical with my genus *Odontocarya*; and that my *Botryopsis* is the same as *Chondodendron*, R. & P., which name claims the preference. *Microlicia* of the same work is synonymous with my *Pleogynæ*. *Sarcopetalum* of the same authors belongs to the tribe *Pachygoneæ*.

### 1. COSCINIUM.

This genus was first proposed by Colebrook for a Ceylon plant (the *Veni-vel* of the natives), the seed of which had been figured by Gaertner as the *Menispermum fenestratum* (De Fruct. i. 219, tab. 46. f. 5). Colebrook's account of the typical plant is very incomplete, as he had not seen either the male or the female flowers, all his data being founded on a short memorandum of Dr. Roxburgh. Gaertner represents the cotyledons of the embryo as being pierced with holes, whence his specific name of *fenestratum*; but in this respect he was undoubtedly mistaken: that excellent carpologist (perhaps from imperfect specimens) quite misunderstood the whole seminal structure; his drawing shows the radicle in the usual position, diametrically contrary to the base of the seed, instead of being directed to a point near it; the cotyledons, though in different cells of the albumen, are shown to be accumbently placed together, not laterally divaricated, and to be pierced with holes, instead of being deeply lacinated on their margins; while the extremely gibbous form of the drupe is not noticed. The drupe is oval, and transverse in regard to its stipitate support, the remains of the style being seen in one of its angles, at a point removed 30° from the base; but as the stipitate support stands at a right angle with the axis of the pedicel, the longer diameter of the fruit is parallel with that axis, so that the style, at the distance mentioned, points towards it. The putamen is correspondingly oval, somewhat flattened on the side of the stipitate support, nearly opposite to which are seen two small collateral pervers

holes, opening into cavities of the internal condyle, which forms a globular expansion on that side within the cell, and upon which the hollow fungilliform seed is moulded. The embryo is situated on the opposite or dorsal side, beneath an extremely thin coating of simple albumen, which is convex on that face, while it is extremely concave, very thick, and deeply cleft all over the opposite side, the thin integuments entering into its numerous anfractuositities. The embryo therefore partakes of the convexity of the dorsal side, its small terete radicle pointing to that part of the cell opposite to the style; while its large cotyledons, of very delicate texture, are divaricately separated on the same plane, deeply lacinated all along their margins, and enclosed in cells of the albumen of corresponding form. In analyzing this seed, the greatest care is necessary in removing the thin plate of albumen which covers the embryo; and it requires a previous knowledge of its position in order to extract it entire, as the force required to break away the albumen, which is solid between the sinuosities of the lacerations of the cotyledons, is likely to injure it,—a caution that is requisite in examining the seeds of the whole of the *Heterocliniæ*.

The authors of the 'Flora Indica' place this genus in a distinct tribe (*Coscinieæ*), on the ground that its petals are larger than the sepals, and that the structure of the seed is different from that of the *Heterocliniæ*; but in this they have considered the three inner sepals as petals, and they have relied upon Gaertner's erroneous figure and description of the seed, not choosing to place faith in my more accurate analysis, to which they allude\*. It will be seen that there is nothing in the structure at variance with all the other genera of the *Heterocliniæ*, except in the lacerated margins of the cotyledons: there are therefore no grounds to justify the retention of the *Coscinieæ* as a distinct tribe, which view has been confirmed by the authors of the 'Genera Plantarum,' who now reject it. The inner row of sepals, considered as petals by the before-mentioned botanists, differ in no respect in their form and appearance, except in size, from the more external rows—a circumstance of uniform occurrence throughout the order. In *Abuta* we have exactly the same number and arrangement of floral envelopes as in *Coscinium*, and they have always been considered as sepals, which is proved by the existence of the ordinary form of scale-like petals in *Tiliacora*, where all the other floral envelopes correspond with those of *Abuta*. We may therefore conclude that in *Coscinium*, as in

\* After the publication of the 'Flora Indica,' I obtained, through the kindness of Sir W. Hooker, fresh drupes of *Coscinium*, by which my previous analysis of seeds given me by Prof. Lindley was completely confirmed.

*Abuta*, *Batschia*, *Anelasma*, *Triclisia*, and *Syrrhonema*, the petals are altogether wanting, as they are apparently deficient in *Fibraurea*, and also absent in the male flowers of *Calycocarpum*.

*Coscinium* is exclusively an Asian genus, generally inhabiting the islands of the Indian Archipelago. Its species are all climbing plants, with very large, thick, coriaceous, coarsely nerved leaves, which are generally covered beneath with thick tomentum: they are oblong, sometimes peltate, in other cases peltate, and supported by long and very strong petioles, which are tumid and tortuous at both extremities.

**COSCINIUM**, Coleb. Pereira, Lindl.—*Flores* dioici. *Masc. Sepala* 9 (imo bracteis 2 donata) in ordine ternario alternatim disposita, quorum 6 interiora majora, spathulato-ovata, valde carnosæ, intus glabra, extus sericea, æstivatione imbricata, demum subrotatim expansa. *Petala* nulla. *Stamina* 6, biserialia, andræceo cylindrico affixa: *filamenta* carnosæ, 3 exteriora libera, apice reflexa, 3 interiora alterna, erecta, ad medium monadelphæ, sepalis interioribus opposita: *antheræ* exteriorum introrsæ, 1-lobæ; interiorum subextrorsæ, 2-lobæ, lobis se junctis, utrinque lateralibus; omnes apice filamentum dorso affixæ, et semi-immersæ, 2-locellatæ, 2-valvatæ, valvis rima longitudinali hiantibus. *Ovari* rudimentum nullum.—*Fœm. Sepala* maris; *petala* nulla; *stamina* 6, sterilia, gynæceo affixa; *ovaria* 3, gibboso-ovata, gynæceo columnari insita, 1-locularia, 1-ovulata. *Stylus* tenuis, brevis. *Stigma* recurvum (sec. Roxb.). *Drupæ* 3, vel abortu pauciores, gibbosæ, subovales v. globosæ, carnosæ, tomentosæ, stipite crasso brevi suffultæ, stylo in angulo versus basin notatæ, 1-spermæ: *putamen* ovatum, osseum, crassum, 1-loculare, dorso convexius, sutura peripherica vix conspicua; *condylus* internus, ventralis, majusculus, globosus, in loculo longe protensus, 2-cameratus, foraminibus 2 extus perforatus: *semen* loculo conforme, meniscoideo-globosum, facie ventrali valde cavum, hinc condylum amplectens, et ei *raphe* longitudinali affixum: *integumenta* tenuiter membranacea, intra plicaturas albuminis insinuata: *embryo* paulo convexus, intra *albumen* amplum carnosum quasi 2-laminare inclusus, lamina externa tenui, interna valde crassa et in lobos plurimos convolutoplicatus undique profunde ruminata; *cotyledonibus* tenuissime foliaceis, valde expansis, undique profunde sinuato-laciniatis, lateraliter divaricatis, et in locellis albuminis utrinque inclusis; *radicula* brevissima, tereti, ad stylum spectante.

*Frutices scandentes, in India Orientali et insulis propinquis indigeni: folia magna, longe petiolata, oblonga, peltata vel palata, 5-7-nervia, crasso-coriacea, supra glabra, subtus tomentosa:*

racemus ♂ *supra-axillaris*, *petiolo brevior*; flores *minuti*, in *capitulis pedunculatis sessiles*, et *dense aggregati*, *omnino cano-tomentosi*.

1. *Cosciniium fenestratum*, Coleb. Linn. Trans. xiii. 51; H. et Th. Fl. Ind. i. 178;—*Menispermum fenestratum*, Gaertner, Fr. i. 219, tab. 46. f. 5; *Roxb. Fl. Ind.* iii. 809; *DC. Syst.* i. 541, *Prodr.* i. 103;—ramulis teretibus, striatis, ferrugineo-tomentosis; ♂ foliis palatis, rotundato-ovatis, imo truncatis et 2-sinuatis, in lobo medio anguste cordatis, apice breviter et subito lineari-attenuatis, ad marginem sæpe acute ac breviter lobatis, 5-nerviis, crasso-coriaceis, supra lucidis, planis, in nervis sulcatis, sub lente tenuissime reticulatis, subtus fulvo vel cano-tomentosis; nervis crassis extus ramosis venisque transversis prominentibus; petiolo longo, ferrugineo-tomentoso, imo tortuoso et incrassato; racemo supra-axillari, tomentoso, petioli tertia parte longitudinis; ramis plurimis, longis, divaricatis, apice capitulatis, capitulis e floribus sessilibus arcte aggregatis: ♀ foliis subpeltatis, deltoideo-ovatis, acutis, acumine lineari-attenuatis, imo truncatis, aut vix cordatis, ad marginem plus minusve lobatis, lobis rotundatis vel subito valde attenuatis, 5-nerviis (præter alios nervos 4 basales vix conspicuos), supra lucidis; racemo fructifero e pedunculo supra-axillari valido, petioli tertia parte longitudinis, apice subumbellatim pedicellato; pedicellis elongatis, crassiusculis, drupas globosas 3-2-1 breviter stipitatas gerentibus.—Ceylon, *v. s. in herb. Mus. Brit.* (König); *in herb. Lindl.*; *in herb. Champ.* ♂ et ♀.

In König's specimen the leaves are  $6\frac{1}{2}$  inches long,  $4\frac{1}{4}$  inches broad, the first pair of nerves running nearly parallel with the margin to near the apex, the petiole measuring 4 inches. In Prof. Lindley's plant, the leaves are 7 inches long,  $5\frac{3}{4}$  inches broad, on a petiole  $3\frac{1}{2}$  inches; here the first pair of nerves sometimes terminates in a short acute lobe. In Major Champion's ♂ plant, the leaves, though much broader and of similar shape at base, are  $6\frac{1}{4}$  inches long,  $5\frac{3}{4}$  inches broad, on a petiole nearly 3 inches long: in the ♀ plant, the leaves are distinctly peltate,  $4\frac{1}{2}$ -5 inches long, 4 inches broad at base, tapering gradually in a sinuous line to an attenuated apex; here the second pair of nerves are often extended into two acute, deep, nearly basal lobes; the petiole is 3 inches long, twisted and tumid at base, and inserted into the blade 2 or 3 lines within the basal margin. In the male plant, the inflorescence is about 1 inch long, with numerous branchlets extending at right angles about  $\frac{1}{2}$  an inch long, each terminated by a globular head 2 or 3 lines in diam. In the fructiferous plant the peduncle is strong, 1-2 inches long, terminated by several radiating pedicels 8-9 lines long, each

supporting nearly globular drupes, which are tomentose and  $\frac{3}{4}$  inch diameter.

2. *Cosciniium Blumeianum*, nob., Ann. Nat. Hist. 2 ser. vii. 37; H. et Th. l. c. p. 179;—*Cocculus Blumeanus*, Wall.;—ramis petiolisque brunneo-velutinis; foliis valde peltatis, lanceolato-oblongis, basi orbicularibus vix cordatis, dehinc gradatim angustioribus, apice repente acutis, 10-nerviis, nervis 2 primis subparallelis et fere ad apicem continuis, crasso-coriaceis, supra nitidissimis, nervis venisque transversis sulcatis, istis subtus valde prominentibus, cum pagina inferiore et petiolo longissimo imo apiceque valde tumefacto dense cano-vel gilvo-tomentosis; racemo supra-axillari petiolo subbreuiore, floribusque sessilibus, dense aggregatis, gilvo-tomentosis; ramis alternis subbreuibus, apice globoso-capitatis; sepalis rotato-expansis, superne glabris, flavescentibus, subtus murino-tomentosis.—Penang, v. s. in herb. Soc. Linn. et Hook. ♂ (Wall. Cat. No. 4971 A).

The branches of this very distinct species are clothed with dense floccose tomentum, and are  $\frac{1}{2}$  inch diam., with internodes 3 inches apart; the leaves above are very polished, very coriaceous, and below are covered with dense white or yellow tomentum, mixed with a few brown silky hairs; they are 12 inches long, or  $10\frac{3}{4}$  inches from the insertion of the petiole,  $4\frac{3}{4}$  to  $7\frac{1}{2}$  inches broad below the middle, the petiole being nearly 7 inches long, terete, barely a line in diam., but swollen for some length at base to a diam. of 4 lines, and thickened at the apex; other leaves are of the same length, with nearly parallel sides, about  $3\frac{1}{2}$  inches broad, suddenly contracted on the margins opposite the insertion of the petiole by a short hollow sinus, and are thus somewhat panduriform, the petiole being 5 inches long. The male raceme, originating at some distance from the petiole, is simple, about 4 or 5 inches long, with ten or fifteen alternate curving pedicels  $\frac{1}{2}$  inch long, bearing rounded heads, 4 lines in diam., of crowded sessile flowers.

3. *Cosciniium Wallichianum*, nob. loc. cit. p. 37;—*C. fenestratum*, H. & Th. (in parte) Fl. Ind. i. 178;—ramis petiolisque dense fulvo-lanatis; foliis oblongis, acutis, basi obtuse rotundatis et subsinuatis, palaceis, 5-nerviis, crasso-coriaceis, supra omnino glabris, nitentibus, in nervis sulcatis, subtus dense sulphureo-tomentosis; nervis crassis venisque transversis valde reticulatis prominentibus; petiolo imo tortuoso et valde incrassato.—Singapoor, v. s. in herb. Soc. Linn., sine flore (Wall. Cat. 4971, sub "*Cocculus Blumeanus*").

The authors of the 'Flora Indica' have considered this to be

identical with the typical species; Wallich, however, regarded it as distinct from that plant, making it a variety of *C. Blume-anum*. It differs from the latter in its palatate leaves and shorter petioles, and from the former in their oblong and more pointed form, with a different tomentum and shorter petioles. Its claims to rank as a distinct species are strengthened by the consideration of the far-distant country of its origin, and because the two other species are quite local. Its branches are covered with woolly fulvous tomentum, and its leaves, which are gradually narrower from the middle to the apex, are  $8\frac{1}{2}$  inches long, 6 inches broad, on a petiole  $2\frac{3}{4}$  inches long.

## 2. CALYCOCARPUM.

This genus was established by Nuttall, in 1838, upon a plant of the Western States of North America, the *Menispermum Lyoni* of Pursh. It is well figured in Gray's 'Genera of the United States,' but the details of the putamen and seed are incomplete. It is a slender climbing plant, having deeply cordate 5-lobed leaves, with sinuated margins, palately fixed upon a long slender petiole; the inflorescence is an axillary, elongated, slender, racemose panicle, nearly as long as the leaf and petiole. It differs from all others of the *Heterocliniæ* in having its male flowers provided with six sepals, no petals, and 12 free stamens in two series; its female flower has six sepals, six small fleshy petals, six sterile stamens, and three or four sessile ovaries, with a very short thick style and a multilacinated spreading stigma. Its drupe contains a meniscoid, orbicular, thin, chartaceous putamen, globose on the dorsal side, with a sharp apical spine; it is concave on the ventral face, furnished on its margin with a number of soft sharp flattened teeth, and along the upper moiety of the ventral face with a carinated longitudinal ridge similarly toothed; the hollow of this face forms a concave scutiform condyle, which protrudes into the centre of the cell, and from its upper part is suspended, by a very short funicle, the deeply meniscoid seed; the embryo is enclosed in the middle of nearly simple albumen, which is marked on the inner face by transverse lines where it is obsoletely ruminated; the small radicle points to the style near the vertex; the cotyledons are flat, foliaceous, oval, greatly divaricated; they partly overlie each other in the upper part, but are widely separated in their lower portion, the albumen being there correspondingly 2-celled to contain them. The genus is therefore marked by very salient characters.

CALYCOCARPUM, Nutt.—*Flores* dioici. *Masc. Sepala* 9, quorum 3 exteriora bracteiformia, 6 interiora multo majora, 2-serialia, subæqualia, spatulato-oblonga, membranacea, æstivatione

imbricata. *Petala* nulla. *Stamina* 12, 4-serialia, libera, quorum 6 sepalis opposita et breviora, 6 interiora longiora et alterna, erecta, longitudine sepalorum; *filamenta* lata, membranacea; *antheræ* 2-lobæ, lobis fere parallelis, dorso affixis, rima longitudinali introrsum dehiscentibus; *ovarii* vestigium nullum.—*Fam. Sepala* 6, obovata. *Petala* 6, iis opposita, triplo breviora, lineari-oblonga, carnosa, intus profunde canali-formia. *Stamina* sterilia 6, petalis paulo longiora; *antheræ* glanduliformes, effcætæ. *Ovaria* 3 vel 4, libera, gynæcio globoso insita, gibboso-oblonga, glabra, 1-locularia; *ovulo* solitario lateri ventrali appenso. *Stylus* brevis, crassus. *Stigma* in lacinias plurimas acutas irregulares radiatas fissum. *Drupæ* 3, globoso-oblongæ, styli vestigio paulo excentrico apiculatæ, carnosæ, glabræ; *putamen* tenuiter chartaceum, meniscoideo-ovatum, dorso globosum, ventre concavum, margine chartaceo in dentes plurimos acutos irregulariter serrato, apiceque spina obliqua armatum, et dehinc carina brevi serrata facie ventrali notatum, 1-loculare; *condylus* subobsoletus, scutiformis, extus concavus, intus valde convexus, et intra loculum protensus; *semen* loculo conforme, meniscoideum, funiculo brevi ex apice condyli suspensum; *integumenta* membranacea, *raphe* longitudinali ventrali non procul ab apice ad basin extensa; *embryo* in *albumine* fere simplici inclusus; *radicula* minima, supera; *cotyledones* ovaes, tenuiter foliaceæ, stipitatæ, primo paulo imbricatæ, dein valde divaricatæ et in locellis distinctis albuminis sepultæ.

*Frutex scandens Americæ Septentrionalis*; folia longe petiolata, profunde 5-loba, marginibus sinuata: paniculæ racemosa, axillares; ♂ elongatæ, multifloræ; ♀ breves, paucifloræ.

1. *Calycocarpum Lyoni*, Nutt. in Torr. & Gr. Fl. N. Amer. i. 48; A. Gray, Gen. Unit. St. i. 75, pl. 30;—*Menispermum Lyoni*, Pursh, Fl. Bor. Am. ii. 371; DC. Syst. i. 541;—scandens, ramulis teneribus, striatulis; foliis profunde cordatis, palmatolobatis, lobis 3-5, subæqualibus, subellipticis, acuminatis, margine irregulariter sinuato-dentatis, supra viridibus, subtus flavido-opacis, utrinque sparsim pilosis; petiolo longissimo, glabro, striato, imo tumidulo; panicula racemosa, ♂ folium cum petiolo subæquante; ramis alternis e basi iterumque ramosis, plurifloris; floribus parvis, iridescenti-albis, imo bracteola donatis.—In Alabama, Tennessee, et Kentucky.

In the specimens I have seen, the branches are  $1\frac{1}{2}$  line diam., the leaves  $5\frac{3}{4}$  inches diam.; the deep lobes, with rounded sinus, are  $2\frac{1}{2}$ — $3\frac{1}{2}$  inches long,  $1\frac{1}{2}$  inch broad; the petiole is 5 inches long,  $\frac{1}{2}$  line thick, palately inserted; the axillary panicle, in form of a slender raceme, is 10 inches long, with branches varying

from  $\frac{1}{2}$  to  $1\frac{1}{4}$  inch long, the ultimate pedicels being 1 line long. In the female plant, the leaves are 7 inches diam., the lobes 3–4 inches long; the petiole is  $7\frac{1}{2}$  inches long, slender, swollen and tortuous at base; the fructiferous raceme is 5 inches long, with eight or nine simple alternate pedicels 3 lines long; drupe 10 lines long, 8 lines diam., semiglobose, obsolete stipitated at base; putamen as before described.

### 3. JATEORHIZA.

The root of the typical species on which this genus is founded was known for a very long period in commerce under the name of *Calumba*; but the plant that produced it remained quite in obscurity until Sir William Hooker published his interesting account of it in the 'Botanical Magazine,' tab. 2970, 2971, under the name of *Cocculus palmatus*. On the examination of its male and female flowers, as well as of its seed, I found that it constituted a new and valid genus, to which the name of *Jateorhiza* was given, on account of the medicinal properties of its root. In 1851, in my "Notes on Menispermaceæ," I gave a very short outline of its leading characters, having two years previously prepared a more ample diagnosis of the genus and the characters of a new species, at the request of Dr. Hooker, which he published in his 'Niger Flora.' The plants of the genus, natives of intertropical Africa, are all climbers, distinguished by a very peculiar habit, having very large deeply lobed leaves, upon very long petioles, and clothed with long strigose hairs; their inflorescence is in long slender racemes; the fruit is a drupe containing a putamen much resembling that of *Odontocarya*, and which in like manner is covered with a dense hairy coating imbedded in the fleshy mesoderm. In the structure of its putamen, and the form of its embryo, imbedded in partially ruminated albumen, it quite conforms with the other genera of the *Heterocliniæ*. The bitter and tonic qualities of *Calumba*-root are supposed to be owing to the presence of a peculiar principle allied to cinchonine, and called calumbine, the exact nature of which is not fully ascertained.

JATEORHIZA, nob.—*Flores* dioici. *Masc.* *Sepala* 6, ovata, 2-seriata, exteriora paulo minora, æstivatione imbricata. *Petala* 6, ovata, sepalis paulo breviora, apice truncata, lateribus introflexis stamina tegentia. *Stamina* 6, petalis opposita et subæquilonga; *filamenta* carnosæ, apice valde tumida ruguloso-punctata subito refracta, et extrorsum antherifera; *antheræ* globoso-4-lobæ, intus 4-locellatæ, rima horizontali 2-valvatis hiantes. *Ovaria* rudimentaria 3, centralia, punctiformia.—*Fœm.* *Sepala* ut in masc. *Petala* cuneato-obovata, crassius-



cula, apice emarginata, lateribus introflexis stamina volventia. *Stamina* 6, sterilia, petalis dimidio breviora; *filamenta* tenuiora, apice subclavata, glandulis 2 effœtis signata. *Ovaria* 3, libera, erecta, oblonga, gibba, extus dense glanduloso-pilosa, gynœcio sub-3-gono imposita, 1-locularia; *ovulo* unico funiculo brevi ex angulo interno supra medium appenso, *Stylus* brevis, crassus, subexcentricus. *Stigma* 3-partitum. laciniis 2-3-fidis, reflexis. *Drupæ* 3, abortu pauciores, ovatæ, carnosæ, 1-spermæ; *putamen* ovatum, dorso convexum, tuberculatum, pilis fibrillosis creberrime indutum, ventre læve; *condylus* ventralis, scutelliformis, ovalis, extus concavus, intus convexus et paulo intrusus; *semen* loculo conforme, meniscoideum; *embryo* intra *albumen* carnosum quasi 2-laminare fere rectus, lamella exteriori simplici tenui, interiori crassiore in fissuras plurimas transversales profunde ruminata; *integumenta* tenuia, intra plicas albuminis insinuata; *cotyledones* membranaceo-foliacæ, spathulato-oblongæ, lateraliter divaricatæ, et in locellis distinctis albuminis sepultæ, *radicula* supera brevi tereti ad summum spectante 10-plo longiores.

Suffrutices *Africa tropicæ*, *alte scandentes*, *setis rigidis vel pilis setosis vestiti*; folia *alterna*, *magna*, *longe petiolata*, *cordata*, *rotundata*, *palmatim* 3-5-7-loba; racemi *axillares*, *elongati*, ramis *laxis* 3-7-floris; flores *vagi*, *pro ordine majusculi, bracteati, subsessiles*, bracteis *longissime setoso-ciliatis donati*.

1. *Jateorhiza palmata*, nob., Ann. Nat. Hist. ser. 2. vii. 38;—*Cocculus palmatus*, DC. Syst. i. 522; *Hook. Bot. Mag.* tab. 2970, 2971;—*Menispermum palmatum*, Lam. Dict. iv. 99; *Calumba*, *Comm.*;—ramis striatis; foliis palmatim 5-7-lobatis, mucronato-apiculatis, sinibus acutis; lobis acuminatis, integris, basalibus profunde auriculatis et approximatis, supra lævigatis, nitidis, subtus pallidioribus, utrinque nervis venisque setis apice glandulosis sparsim hispidis, margine setosociliatis; petiolo crasso, elongato, striato, basi incrassato, fere glabro; racemo ♂ axillari, gracili, petiolo fere 2-plo longiore, setis paucis retrorsis hispidulo, ramis laxis plurifloris; racemo ♀ petiolo dimidio brevior, floribus densioribus, pedicellis 1-floris.—Mozambique (lat. 16° aust.), v. s. ♂ et ♀ in herb. *Hook.* (Bojer, a Telfairio in insul. Mauritian. cult.); in herb. *Soc. Linn.*, Wall. Cat. 4953 c. Mauritius (Telfair).

This species is very distinct from that cultivated in the Calcutta Botanic Garden, the two having been confounded together. The leaves are orbicular, 14 inches diam.; the central lobe from the insertion of the petiole is 10 inches long, the lateral lobes

$8\frac{1}{2}$  inches, the lower lobes 8 inches, the basal portions of which are closely approximated and extend  $3\frac{1}{2}$  inches below the insertion of the petiole; the petiole is  $6\frac{3}{4}$  inches long, and 2 lines diam. The peduncle of the male raceme is 12 inches long, slender, polished, of a reddish chestnut-colour, striated, and furnished with a very few retrorse stiff hairs, which are sometimes glandular at the apex; its branchlets 2 lines apart are bracteated, 6–8 lines long, with nearly sessile flowers; the female raceme is simple, 3 inches long, with a few distant 1-flowered pedicels, 3 lines long.

2. *Jateorhiza Calumba*, nob. ;—*Cocculus palmatus*, Wall. (*non DC.*) ;—*Menispermum Columba*, Roxb. *Fl. Ind.* iii. 807 (*non Comm.*) ;—ramulis teretibus, angulato-striatis, breviter retrorsum hispido-pilosis; foliis late orbicularibus, sinuato-lobatis, sinibus rotundatis, lobis 5, late ovatis, acutis, apice mucronato-acuminatis, basalibus profunde divaricatis, et hinc late cordatis, 7–9-nerviis, supra opacis, utrinque pilis brevibus adpressis curvulis rufescentibus munitis, subtus pallidis, nervis venisque valde reticulatis prominentibus, in nervis longius et patenter glanduloso-hispidulis; petiolo subtenui, striato, imo incrassato et tortuoso, patenter glanduloso-hispido; racemis axillaribus, solitariis vel plurimis, ♂ foliis longioribus, imo nudis; rachi valde elongata, striata, patenter strigosa, ramis elongatis, divaricatis, fere capillaribus, glabris, subflexuosis, paucifloris, imo bractea lineari setoso-ciliata donatis; floribus sessilibus, fere ebracteatis.—In Africa Australi, ora orientali inter Mozimba et Ibo (lat.  $11^{\circ}$  aust.), *v. s. in herb. Soc. Linn.* (Wall. Cat. 4953, hort. Bot. Calc. cult.).

I have nowhere seen native specimens of this species, the male plant of which was introduced, many years ago, from the locality above quoted into the Botanic Garden of Calcutta, where it is still cultivated. A long account of it was published by Dr. Berry, in the 'Asiatic Researches' (x. 385, t. 5). Its native place is  $5^{\circ}$  to the northward of Mozambique, where the former species is found. Its branches are soft and of very lax texture, of annual growth, seldom exceeding  $\frac{3}{8}$  inch diam.; its leaves are not so membranaceous as those of the former species, and in no degree polished above, the reticulations being finer, more numerous, and more prominent: in the former species the incisures are acute; here they are wide and rounded; and the basal lobes, which in the former are longer, more parallel, and nearly overlapping one another, are here shorter and much divaricated: the petiole is not so densely pilose, and is only half the thickness of that of the former. The inflorescence is very dif-

ferent, the flowers being larger, and the ciliated bracts at the base of the branchlets far more conspicuous. The leaves are smaller and broader in proportion, their total length, including the basal lobes, being  $7\frac{3}{4}$  inches, while their breadth is  $9\frac{1}{2}$  inches, the central lobe from the insertion of the petiole measuring 6 inches, the lateral lobes  $5\frac{3}{4}$  inches, the lower lobes 5 inches, the basal portions of which are wide apart, and extend  $1\frac{3}{4}$  inch below the line of insertion of the petiole; the petiole measures  $5\frac{1}{2}$  inches, and is 1 line diam. The male raceme is 18 inches long, its rachis being sparsely pilose with spreading glandular reddish hairs; its branchlets are divaricated, filiform, flexuose, glabrous,  $1\frac{1}{2}$  inch long, and 7-8-flowered; the flowers are sessile, glabrous, and 3 lines diam. when expanded.

3. *Jateorhiza strigosa*, nob., Hook. Fl. Nig. 212, pl. 18;—*Cocculus macranthus*, Hook. fl. in Hook. Icon. pl. 759;—foliis rotundatis, sinuato-3-lobatis, basi profunde inciso-cordatis; lobis acute 3-angularibus, mucronatis, lateralibus imo in auriculas basales profundas rotundatis, marginibus parallelis fere approximatis, submembranaceis, reticulatis, supra nitidis, subtus pallidioribus, 7-nerviis, nervis utrinque setoso-strigosis, setis adpressis rigidis rufulis longiusculis, margine dense setoso-ciliatis; petiolo striato, auriculis 2-plo longiore, arcte setoso-strigoso; racemo axillari; floribus cæruleo coloratis (Smith), lutescenti-albis (Vogel).—In Africa, ora occidentali, v. s. in herb. Mus. Brit., Congo et ins. Fernando Po (Exped. Tuckey); in herb. Hook. ♂ et ♀, Clarence Cove, Fernando Po (Vogel).

This is a very distinct species. The leaves, including the basal lobes, are  $9\frac{1}{2}$  inches long, 9 inches broad; from the apex to the insertion of the petiole is  $7\frac{1}{4}$  inches; the lateral lobes, with a broad intervening sinus or undulation, are 6 inches long; the depth of the basal lobes is therefore  $2\frac{1}{4}$  inches; the petiole is  $5\frac{1}{2}$  inches long. The raceme is 5 inches long, its branchlets 2-3 lines in length; its flowers are much smaller than those of the preceding species, and about the size of those of the first-mentioned typical plant, scarcely exceeding 2 lines diam. when expanded. The above dimensions are from the specimen in the British Museum: in those of Vogel's Collection the leaves are only 3- $4\frac{1}{2}$  inches long, 4-6 inches broad, on a petiole 6-8 inches long; the racemes are only 2-4 inches long.

#### 4. TINOSPORA.

The first outline of this genus was given in my "Remarks on *Menispermaceæ*," in 1851 (Ann. Nat. Hist.). It comprises a group of Asian and African plants, all of climbing growth, the

type of which is the *Cocculus cordifolius*, DC.: the stems have a lax, splitting, membranaceous bark, often furnished with verrucose tubercles. Colebrook and Roxburgh relate, concerning some of the species mentioned below, that when any portion of their stems becomes severed, it sends out, even from the greatest height, a sprout which lengthens downwards till it reaches the ground, when it takes root, by which the severed portion continues to maintain its flourishing growth; and they have seen radican shoots of this description, 30 feet long, not thicker than a pack-thread. The plants have all roundish cordate leaves, more or less membranaceous, generally glabrous, upon slender petioles; their inflorescence is an elongated supra-axillary raceme, with small glabrous flowers; their somewhat globular fleshy drupes contain a spherical, smooth or tuberculated, subosseous putamen, having a globular, hollow, internal condyle on the ventral face, with a small external aperture: round this condyle the meniscus-shaped seed, which fills the cell of the putamen, is moulded, and attached by the longitudinal line of the raphe. The embryo (as in all the rest of the *Heterocliniæ*) has a superior terete radicle and large divaricating foliaceous cotyledons, imbedded in distinct cells of a copious ruminated albumen.

**TINOSPORA**, nob.—*Flores* dioici. *Masc. Sepala* 6, biseriata, exteriora minora, obovata, glabra, submembranacea, margine eroso-crenulata; æstivatione imbricata. *Petala* 6, minuta, sepalis opposita, imo subunguiculata, apicem versus 3-loba, lobis lateralibus inflexis, stamina amplectentibus. *Stamina* 6, libera, divaricato-potentia, petalis opposita: *filamenta* longiuscula, apice clavato-incrassata; *antheræ* 2-lobæ, subextrorsæ, lobis oblongis, apice conniventibus, imo divaricatis, utrinque lateraliter semiimmersis, rima obliqua fere marginali longitudinaliter dehiscentibus. *Ovaria* rudimentaria nulla.—*Fœm. Sepala* ut in masc. *Petala* minuta, spathulato-oblonga, erecta. *Stamina* sterilia, 6, petalis opposita, breviora et cum illis imo gynæcii affixa: *antheris* effœtis. *Ovaria* 3, gibboso-oblonga, libera, supra gynæcium cylindricum imposita, erecta, 1-locularia; *ovulo* unico anatropo supra medium loculi ex angulo interno funiculo brevi appenso. *Stylus* brevis, crassus. *Stigma* subliguliformi-peltatum, subcavum, margine sinuatum, aut profunde 3-laciniatum, laciniis inæqualibus rotundatis. *Drupa* 3, vel abortu pauciores, globosæ, gibbosulæ, carnosæ, breviter stipitata, stigmate persistente subexcentrico apiculatæ: *putamen* osseo-pergamineum, compresso-subglobosum, dorso convexius, hic sæpe tuberculatum, sutura peripherica, sub-2-valvare, ventre subplanum, hinc

intus *condylo* magno cavo globoso usque ad medium loculi protenso, meatu externo lineari perforato instructum. *Semen* loculo conforme, meniscoideum, ad faciem ventralem valde cavum: *integumenta* tenuissima, intra fissuras albuminis plicata, *raphe* ventrali longitudinali signata: *embryo* intra albumen 2-laminare inclusus, lamina dorsali tenui, simplici, ventrali crassiore, in rugas plurimas transversas profunde ruminata; *cotyledonibus* tenuissime foliaceis, ovatis, 3-nerviis, valde divaricatis, in locellis sejunctis utrinque absconditis, *radicula* supera tereti multo longioribus.

Frutices *alte scandentes*, *Asiae, Australasiae, et Africae intertropicae*: folia *petiolata, cordata, submembranacea, 3-5-nervia*: racemi *simplices, extra-axillares*; ramis *plurimis, imo bracteatis, 1-4-floris*; flores *aggregati, flavi*.

1. *Tinospora cordifolia*, nob., Ann. Nat. Hist. ser. 2. vii. 38; Hook. & Th. Fl. Ind. i. 184;—*Cocculus cordifolius*, DC. Syst. i. 518, Prodr. i. 97; *Rheede, Hort. Mal.* vii. 39, tab. 21; *W. & A. Fl. Ind.* i. 12; *Wight, Icon.* ii. tab. 485, 486; *Colebr. Linn. Trans.* xiii. 62;—*Cocculus convolvulaceus*, DC. Syst. i. 518, Prodr. i. 97;—*Cocculus verrucosus*, Wall. Cat. (*partim*);—*Menispermum cordifolium*, Willd. iv. 826; *Roxb. Fl. Ind.* iii. 811;—ramulis teretibus, striatis, cortice laxo, nitente, tuberculato; foliis suborbicularibus, late cordatis, acutis aut repente tenuiter acuminatis, glaberrimis, submembranaceis, 7-nerviis, subtus subglaucis; petiolo limbo brevioris aut subæquilongo; racemis in axillis solitariis, simplicibus, glabris, ♂ folio brevioribus, ♀ folio longioribus; floribus ♂ fasciculatis, ♀ solitariis; drupis rubris, cerasiformibus, siccitate pisi magnitudine.—In India orientali, *v. s. in herb. Soc. Linn.*, Mungger (Wall. Cat. 4955), Ava (Wall. Cat. 4966 B, sub *Coc. verrucosus*); *in herb. Mus. Brit. et Hook.* (Wight, 44), &c.

This species appears to have an extensive range all over the peninsula of India, extending even to Ceylon: the length of the leaves is 2–4 inches, their breadth is the same, or more; the petiole is  $1\frac{1}{2}$ – $2\frac{1}{2}$  inches long; on their under surface, at the junction of the nerves (which, however, are not connected by a membrane), an oblong brown spot is usually seen between them; the ♂ raceme is  $2\frac{1}{2}$  inches, the ♀ 5 inches long. *C. cordifolius*, DC., seems to be the ♂, and *C. convolvulaceus*, DC., the ♀ plant. In the male flower, the petals are 3-lobed, and their inflected lobes embrace the filaments; in the female, the petals are cuneately oblong, with entire margins, which are not inflected: the inner sepals scarcely exceed a line in length.

2. *Tinospora palminervis*, nob.;—*Cocculus verrucosus*, Wall. (*partim*);—cortice laxo, verrucoso; ramulis junioribus subangu-

latis, glabris, lenticellis parvis signatis; foliis remotis, deltoideo-oblongis, acuminatis, marginibus integris vel repando-sinuatis, imo cordatis, sinu subangulato, 5-7-nerviis, membranaceis, glaberrimis, supra pallidis, subtus glaucis, hinc nervis ad concursum basalem membranula ligatis; petiolo limbo fere 3-plo brevioribus; racemis ♂ geminis vel solitariis, supra-axillaribus, gracilibus, folio vix longioribus; floribus 2-3, in ramis brevibus pedicellatis.—In Birma, *v. s. in herb. Soc. Linn.*, fluv. Irawaddi (Wall. Cat. 4966).

In its general features this species approaches the preceding, both having cordate, glabrous, pale, membranaceous leaves upon very slender petioles, which seldom exceed half the length of the blade; they have a similar verrucose bark; but the leaves are deltoideally oblong, acute, with sinuose margins, and the basal nerves beneath are united by web-shaped membrane, leaving hollow spaces beneath them, while the corresponding portion of the upper surface shows a large brown spot, as in *T. cordifolia*. The leaves are  $2\frac{1}{2}$ -4 inches long, with a broad angular sinus  $\frac{1}{2}$  inch deep; they are 2- $3\frac{1}{4}$  inches broad, on a very slender petiole 1- $1\frac{1}{2}$  inch long. The male slender racemes are  $3\frac{1}{2}$ -8 inches long, with alternate branches  $\frac{1}{4}$ - $\frac{3}{8}$  inch long, bracteolated at base, and bearing two or three flowers on very short pedicels.

3. *Tinospora Malabarica*, nob. *l. c.*; Hook. & Th. *l. c.* 183;—*Cocculus Malabaricus*, *DC. Syst.* i. 518, *Prodr.* i. 97; *Rheede, Hort. Mal.* vii. t. 19, 20;—*Menispermum Malabaricum*, *Lam. Dict.* iv. 96; *Willd. Syst.* iv. 826;—ramulis tortuosis, teretibus, verruculosis, pilis albidis adspersis; foliis sparsis, obovatis, acutis, apice acuminatis, imo profunde cordatis, sinu rotundato, 7-nerviis, reticulatis, pallide membranaceis, supra pilosulis, subtus pubescentibus; petiolo tereti, basi incrassato, piloso, limbo fere dimidio brevioribus; racemis supra-axillaribus, tomentosis, ♂ folii longitudine, ♀ simplicibus, petiolo brevioribus; floribus viridibus; drupis cerasiformibus, pallide rubris.—In Malabar, *v. s. in herb. Soc. Linn.* (Wall. Cat. 4969).

In this distinct species the leaves are about  $5\frac{3}{4}$  inches long from the bottom of the basal lobes, or  $4\frac{3}{4}$  inches from the insertion of the petiole to the apex, 4 inches broad, on a petiole 3 inches long; the fructiferous raceme is 2 inches long, the alternate pedicels about 3 lines long; the drupes, of a bright-red colour, are stipitated; the putamen, about 3 lines long, marked externally by many sharp-pointed tubercles arranged in longitudinal interrupted lines.

Var. *scabridula*;—foliis remotis, longe petiolatis, suborbicularibus, gradatim angustioribus, apice repente cuspidato-at-

tenuatis, imo profunde ac late cordatis, pallidis, supra ruguloso-scabris, subtus tomento sparso pubescentibus, nervis prominentibus, et ad basin membranula ligatis; petiolo limbo subæquilongo, imo incrassato et torto, puberulo.—Khasia et Chittagong, *v. s. in herb. Hook.*

Its leaves are  $5\frac{1}{4}$  inches long (or  $4\frac{3}{8}$  from the basal sinus to the apex),  $4\frac{3}{4}$  inches broad; petiole  $4\frac{1}{2}$ – $4\frac{3}{4}$  inches long.

4. *Tinospora tomentosa*, nob. *l. c.*; Hook. & Th. *l. c.* 182;—*Cocculus tomentosus*, *Coleb. Linn. Trans.* xiii. 59;—*Menispermum tomentosum*, *Roxb. Fl. Ind.* iii. 813;—ramulis striatis, cortice rimoso, piloso, tuberculis minutis exasperatis; foliis orbiculato-ovatis, basi in sinum latissimum cordatis, apice rotundato-obtusis, retusis, margine sinuatis, 7-nerviis, valde membranaceis, pallidis, supra pubescentibus, subtus cano-tomentosis; petiolo limbo paulo brevior; racemis supra-axillaribus, simplicibus; floribus paucis, aggregatis, sepalis expansis, petalis subintegris; drupis aurantiacis.—In Bengalia et Ava, *v. s. sine flore aut fructu, in herb. Soc. Linn.* (Wall. Cat. 4956 A, B).

Colebrook states that its leaves are from 3 to 6 inches long, and about the same breadth, with a petiole of nearly equal length. In Wallich's specimen they are 4 inches long,  $3\frac{1}{2}$  inches broad, sinuated near the summit; the apex is obtusely narrowed and deeply emarginated, the petiole being 3 inches long. In Roxburgh's specimen, the sinuated margins are almost obsolete, while the summit has a deep emargination, with a mucronate point: it is 4 inches long,  $3\frac{1}{2}$  inches broad, the petiole, thickened at its base, being  $2\frac{1}{4}$  inches long. The drupes are said to be orange-red, the size of a large pea, enclosing a tuberculated putamen.

5. *Tinospora glauca*, nob.;—*Cocculus glaucus*, *DC. Syst.* i. 521, *Prodr.* i. 97;—*Menispermum glaucum*, *Lam. Dict.* iv. 100; *Rumph. Amb.* v. 40, t. 25. f. 1;—ramulis teneribus, teretibus, pilosis; foliis vagis, orbiculari-cordatis, acuminatis, imo macula purpurascente notatis, et hinc 5-nerviis, supra flavescens, subtus glaucis et pubescentibus; petiolo rigido, imo recurvo, folio fere dimidio brevior; racemis paniculatis, petiolo brevioribus; drupis purpureo-nigricantibus, parvis.—In Amboyna.

This is described as a climber, with distant leaves, 3–4 inches long, and of equal breadth. Lamarck considered this species to be distinguished from the preceding ones by its much shorter racemes and its much smaller drupes of a blackish hue, scarcely as large as a peppercorn: its putamen is somewhat compressed and tuberculated.

6. *Tinospora crispa*, nob., Hook. & Th. *l. c.* 183;—*Cocculus crispus*, DC. *Syst.* i. 521, *Prodr.* i. 97; *Colebr. l. c.* p. 60, tab. 5. f. 3;—*Menispermum crispum*, Linn.;—*Menispermum tuberculatum*, Lam. *Dict.* iv. 96;—*Menispermum verrucosum*, Roxb. *Fl. Ind.* iii. 808;—ramis glaberrimis, cortice nitido, laxo, brunnescente, striato-corrugato, remotiuscule verrucosis; foliis interdum crebriter approximatis, longissime petiolatis, suborbicularibus, imo late 2-sinuato-cordatis, apice subito ac breviter acutis, valde membranaceis, 5–7-nerviis, sub lente rugoso-punctulatis, utrinque glaberrimis, glauco-pallidis, nervis subtenuibus paulo prominulis et rufulis; petiolo limbo multo longiore, compresso, sulcato-striato, imo incrassato et tortuoso, flavide pruinoso; racemo fructifero petiolo 3-plo brevioris, pedicellis alternis, patentibus; drupis majoribus, subglobosis, uviformibus, flavescenti-puberulis vel pruinosis. —In India orientali, *v. s. in herb. Hook.* Assam (Griffiths) et Sandoway (Capt. Margrave).

This species is said by different botanists to be common in Sumatra, the Molucca Islands, and Sylhet, and ought therefore to occur frequently in collections; it is strange, therefore, that this is the first specimen I have seen in any herbarium that corresponds with the written descriptions of it, among which Colebrook's is fullest in details; but he says the leaves are remote, which seems at variance with the specimen in question. Whether this plant truly represents the *Cocculus crispus*, DC., time must show. The branchlets, 4 lines in diam., have a thin lax bark, of peculiar appearance: it is longitudinally corrugated or crisped, with numerous raised cup-shaped cicatrices, that leave no impression upon the wood beneath—a character that distinguishes it from most other species: these cicatrices are placed promiscuously all round the stem of the branch, at intervals of  $\frac{1}{4}$ – $\frac{1}{2}$  inch apart, presenting a very different appearance from the verrucosities of the bark of other species, which are caused by the swelling of the lenticels, and usually appear as minute bead-like prominences round a punctiform centre. In the specimen above cited six or seven petioles are entangled together by their tortuous bases, just as they have fallen off in a heap from the stem; and on a new branchlet a number of young leaves are to be seen crowded together in a similar manner. The leaves are  $4\frac{3}{4}$  inches long, the depth of the basal attenuation and corresponding sinus on each side being 3 lines; they are 4 inches broad, the petiole being of the unusual length of  $5\frac{1}{4}$  inches and  $\frac{3}{4}$  line in diam., which is three times as long as, and stouter in proportion to the size of the blade than in *T. palmi-nervis*, which plant I was at first inclined to refer to *T. crispa*: the secondary nervures at their axils, and the five principal nerves



at their confluence with the petiole, are connected by a web-shaped membrane. The fructiferous raceme is  $2\frac{1}{4}$  inches long; the pedicels rigid, much divaricated,  $\frac{3}{4}$  inch long; the drupes 8 lines long, 6 lines in diam. when dry; the putamen,  $6\frac{1}{2}$  lines long, has a scrobiculated surface covered with a white pruinose down. Colebrook (*l. c.*) gives a tolerably correct analysis of the fruit and seed.

Var. *nitidiuscula*;—foliis oblongo-ovatis, profunde et late cordatis, e medio sensim angustioribus, apice subito acuminatis, utrinque glaberrimis, subtus præsertim nitentibus, hinc nervis 5, ad concursum membranula conspicua connexis; petiolo limbo fere æquilongo.—Khasia, in *herb. Hook.* (*Hook. & Th.*) sine flore.

This is probably a distinct species; but I have placed it here till better evidence is obtained: it differs from all others in the peculiar texture of the leaves and the remarkably shining appearance of their under surface; its branchlets are 1 line in diam., with internodes of  $3\frac{1}{2}$  inches, the leaves are  $4\frac{1}{4}$ – $4\frac{1}{2}$  inches from the bottom of the rounded basal sinus to the apex, or  $4\frac{1}{2}$ – $5\frac{1}{4}$  inches from the bottom of the basal lobes, and  $3\frac{1}{2}$ – $3\frac{3}{4}$  inches broad, on a petiole 4 inches long.

7. *Tinospora uliginosa*, nob.;—ramulis teretibus, glabris, lenticellis parvis 4-lobulatis signatis; foliis remotis, oblongis, cordatis, marginibus subpandurato-sinuatis, apice acuminatis, subcoriaceis, glaberrimis, 5-nerviis, subtus pallidis, nervis venisque valde reticulatis prominentibus; petiolo tenui, imo incrassato et tortuoso, limbo subæquilongo vel dimidio brevioris; racemis axillaribus, glaberrimis, folio longioribus; rachis tenui, simpliciter pedicellata, pedicellis 1-floris, floribus viridibus, pro mole majoribus.—In Java et Borneo, *v. s. in herb. Hook.*; ♂ Java (Zollinger, 568); ♀ Barmassing, Borneo (Motley, 716).

The authors of the 'Flora Indica,' though evidently with some doubt, have considered this plant as identical with *T. crispa*: it agrees with it far less in general habit than with many others; but it differs in its leaves, which are smaller, more oblong, less cordate, more coriaceous and rigid in texture, and they have a more elongated raceme. The leaves are  $2\frac{3}{4}$ – $3\frac{3}{4}$  inches long,  $1\frac{1}{2}$ –2 inches broad; the petiole 1–2 inches long. The ♂ raceme is 4–8 inches long, its flowers larger, its inner sepals being 2 lines long, which is twice the size of those in the typical species. In the Borneo specimen, which I have considered identical, the leaves are smaller, the petiole and raceme shorter: it is described as a climbing plant, growing in marshy places; the ovaries are supported by a long cylindrical gynæcium.

8. *Tinospora reticulata*, nob.;—scandens; ramulis teneribus, teretibus, glabris, remote lenticellatis; foliis ovatis aut oblongis, basi truncatis et 2-sinuatis, vix cordatis, circa petiolum attenuatis, apice repente acuminatis, et hinc canaliculato-recurvis, imo 5-nerviis, reticulatis, vix membranaceis, glaberrimis, utrinque pallidis et subnitidis; racemo axillari, petiolo 4-plo longiore, basi foliifero.—In ins. Philippinis, *v. s. in herb. variis* (Cuming, 1286).

This plant has the peculiarity, seen in all the following species from Africa and Australia, of bearing rudimentary, and often deciduous, petiolated leaflets in the lower axils of the racemes, which in *T. Bakis* are largely developed. The branchlets are slender, quite glabrous, dull, and striated with a few raised lenticels, the internodes being of 2 inches; the leaves are 3–4 inches long, 2–2½ inches broad, with a petiole 1–1½ inch long; the racemes are 4–6 inches long, the three lowermost flowerless axils 1 inch apart, bearing alternate leaflets similar in form, 1 inch long, ¾ inch broad, on a petiole ⅝ inch long; the pedicels are 2 lines long, 2–3 lines apart, bracteated at base, all very glabrous; the flowers are somewhat large, the inner sepals being fully 1½ line long.

9. *Tinospora Bakis*, nob.;—Cocculus Bakis, *A. Rich. in Guill. et Perott. Fl. Seneg.* i. 12, tab. 4;—ramulis teretibus, subsuberosis, glabris, striatis, cortice pallido rimoso verruculoso tectis; foliis oblongis, profunde cordatis, lobis basalibus rotundatis, apice longe acuminatis et mucronatis, canaliculato-recurvis, et hinc subconduplicatis, submembranaceis, glaberrimis, 5–7-nerviis, nervis supra immersis, subtus prominulis; pedunculis axillaribus, 1–3-floris, vel in ramulis novellis apice aphyllis racemum terminalem glaberrimum efformantibus; racemis ♀ folio brevioribus.—In Africa tropica septentrionali, *v. s. in herb. DC.*, Senegambia ♂ (Perottet); *in herb. Delessert.* (Heudelot); *in herb. Hook.*, Nubia, ad Fazokel, ♂ (Kotschky, 421); Cordofan, ♀ (Kotschky, 244).

I have considered the latter specimens as specifically identical with the former, which is the typical plant of Perottet's collection, the only difference being that in the former the leaves have a broad sinus at the base, while in the latter the basal lobes are separated by a more acute sinus. The leaves are 2–3 inches long, 2–2½ inches broad, on a petiole 1–1¼ inch long; the axillary raceme is almost filiform, 4–6 inches long, often, but not always, leaf-bearing at its base, as in the preceding species, the leaves there being 1¼–1½ inch long, 1¼–1½ inch broad, on a petiole 4 lines long; the alternate pedicels, bracteated at base, are 1 line long; the flower expanded, 3 lines in diam.

10. *Tinospora tenera*, nob.;—glaberrima, ramulis tenerrimis, teretibus, striatis, verruculoso-tuberculatis; foliis rotundato-ovatis, imo cordatis, sinu acuto, lobis basalibus rotundatis, e medio gradatim acutioribus, apice recurvis et breviter attenuatis, vix membranaceis, 5-nerviis, nervis teneribus, supra rugoso-punctatis, punctis nigris, subtus pallidioribus, nervis venisque reticulatis paulo prominentibus; petiolo sublongo, tenerrimo, subito deflexo; racemis solitariis, supra-axillaribus, glaberrimis, valde elongatis; rachi filiformi; pedicellis brevissimis, 1-floris.—In Africa orientali, *v. s. in herb. Hook.*, Lower Shire Valley, Zambesi (Dr. Kirk).

A climbing plant, collected during Dr. Livingstone's explorations up the River Zambesi, having slender branches  $\frac{3}{4}$ –1 line in diam., with internodes of  $1\frac{3}{4}$ – $2\frac{1}{8}$  inches; leaves 2– $2\frac{5}{8}$  inches from the end of the basal lobes to the apex, or  $1\frac{3}{4}$ – $2\frac{3}{8}$  inches long from the basal sinus,  $1\frac{3}{4}$ – $2\frac{1}{8}$  inches broad, with a petiole  $1\frac{1}{2}$  inch long; the punctate raised dots on the upper surface of the leaves are not at all scabrid; the raceme is 5–7 inches long.

11. *Tinospora Smilacina*, Bth. Proc. Linn. Soc. v. Suppl. 52;—glabra; ramulis subcoriaceis; foliis deltoideo-ovatis, profunde cordatis, sinu subangulato, lobis basalibus intus rectis, extus rotundatis, apice acutis et acuminatis, imo 5-nerviis, utrinque glabris et pallidis, nervis supra immersis, subtus prominulis, reticulatis; petiolo tenui limbo dimidio brevioris; racemis axillaribus, simplicibus, petiolo paulo longioribus, imo foliolis minimis petiolatis donatis; floribus parvis viridulis.—In Australia centrali, *v. s. in herb. Hook.*, Plains of Promise (Dr. Moore).

This is a slender climbing plant, with internodes of 1– $1\frac{1}{2}$  inch; its leaves, from the basal lobes to the apex, 24–33 lines long, or from the basal sinus 19–25 lines long, 26 lines broad, with a petiole 10–12 lines long. The ♂ raceme is 18 lines long, pedicels 1 line long, with petiolated bracts at base 2 lines long; the three inner sepals are ovate, 1 line long, the membranaceous obovate petals  $\frac{1}{2}$  line long; its drupes are ovate, 3 lines long.

##### 5. CHASMANTHERA.

The typical species collected by Schimper in Abyssinia was named *Chasmanthera dependens* by Hochstetter, who gave an imperfect description of the genus in the 'Ratisbon Flora' for 1843. This plant has a very peculiar habit, having large orbicular cordate hairy leaves, on long petioles, and a very elongated slender simple raceme. It belongs to the tribe *Heterocliniæ*, as shown by the structure of its fruit: its putamen is oval, compressed,

and 3-dentate, as in *Odontocarya*; but its condyle is internal, globular, and hollow, with an external linear foramen, as in *Tinospora*. Its sepals and petals have the usual ternary disposition, and its 6 central stamens are monadelphous for half their length. Some of the specimens have male flowers; the others are in fruit; although the drupes are not sufficiently matured to distinguish the embryo, the structure of the putamen, with its seed, is quite evident. I have added a second species from western tropical Africa.

CHASMANTHERA, Hochs.—Char. reform. *Flores* dioici. *Masc.*

*Sepala* 6, alternatim 2-serialia, 3 exteriora linearia, acuminata, extus hirsuta, setis longis ciliata, 3 interiora rotundato-oblonga, margine eroso-denticulata, basi cuneata, concava, tenuiter membranacea, 3-nervia, dorso hirsutiuscula. *Petala* 6, biserialia, sepalis paulo breviora, carnosae, oblonga, obtusa, imo breviter unguiculata, marginibus vix inflexis, infus linea loriformi prominente signata. *Stamina* 6, petalis opposita, erecta, connata; *filamenta* petalis æquilongae, e basi ultra medium in cylindrum crassum monodelphum coalita, superne libera; *antheræ* basifixæ, subcordatæ, 2-lobæ, lobis oblongis, collateralibus, connectivo angusto adnatis, rima marginali dehiscentibus. *Ovaria* rudimentaria vel nulla.—*Fœm.* ignoti. *Drupæ* 3, ovatæ, carnosæ, erectæ, sessiles, apice stylo subexcentrico apiculatæ: *putamen* ovatum, compressum, osseum, extus convexum, carina dorsali in apiculum terminata, ventre planum; *condylus* hinc internus, ovato-globosus, cavus, meatu externo longitudinali perforatus: cætera ignota.

Frutices *Africani scandentes*, ramulis *longissimis, dependentibus*; folia *majuscula, late orbiculata, reniformi-cordata, subsinuato-lobata, 7-9-nervia, tenuia, reticulata, utrinque pubescentia, longissime petiolata*: racemi *axillares, simplices, petiolo longiores*; flores *breviter pedicellati, bracteati*.

1. *Chasmanthera dependens*, Hochst. Fl. Zeit. 27. i. 21;—ramis striatis, cortice nitido, membranaceo, verrucoso-tuberculato, rimoso; foliis amplis, suborbicularibus, imo reniformi-cordatis, et hinc sinu in petiolum breviter retractis, apice aut subacutis, vel emarginatis et mucronatis, ad margines ciliatos sinuato-sublobatis, submembranaceis, pallidis, 7-nerviis, valde reticulatis, utrinque flavido-pubescentibus; petiolo folio æquilongo, debili, imo tortuoso, vix incrassato, cum cupula nodosa articulato; racemo simplici, graciliter pendente, axillari, pubescente, folio longiore, pedicellis brevibus, approximatis, imo bracteatis; floribus viridescentibus, membranaceis; fructibus rubris.—In Africa tropica, v. s. in herb. meo et

*aliorum*; Abyssinia ad fluv. Tacaze (Schimper, ♂ n. 654, ♀ n. 1666); fluv. Quorra ♂ (Baxter, 1731, ♀ Baxter, 1728).

This is described as a twining shrub, growing in shady woods, having long, slender, pendent branches, with a peeling, smooth, and tuberculated bark. I cannot perceive any specific difference in the plants from the two distant localities. The leaves of Schimper's ♂ specimens, on young branches, are about  $2\frac{1}{2}$  inches in diameter, and from the point of their origin the male racemes spring; the older leaves, as in Baxter's ♂ specimens, are much larger, more acute, sinuously 5-lobed,  $5\frac{1}{2}$  inches long from the basal sinus to the apex, or  $6\frac{3}{4}$  inches from the bottom of the basal lobes, and  $6\frac{1}{4}$  inches broad, on a petiole  $2\frac{3}{4}$  inches long. In Schimper's ♀ plant the leaves are  $4\frac{3}{4}$  inches from the petiole to the apex, and are 6 inches long including the basal lobes, between which they are 2-sinuate; their breadth at the greatest diameter is 7 inches; they are of thin texture, very pale, and pubescent; the petiole is  $4\frac{1}{2}$  inches long, and pubescent. The male raceme is slender, pendent, pubescent, 5-6 inches long, the pedicels 1 line long, each having a linear hairy bract of equal length, and bearing a single flower, the parts of which are membranaceous; the fructiferous raceme is 10 inches long; the pedicels are nearly  $\frac{1}{2}$  an inch long, supporting a drupe of about the same length, and  $\frac{3}{8}$  inch diameter.

2. *Chasmanthera nervosa*, nob.;—glaberrima, ramulis tenuiter teretibus, striatis, nigris, nitentibus; foliis rotundato-ovatis, imo profunde cordatis, lobis basalibus rotundatis, e medio sensim angustioribus, apice acuminatis, 5-nerviis, utrinque glaberrimis, supra viridibus, nitidis, nervis prominulis, subtus pallide glaucis, nervis tenuibus prominentibus nigris, hinc circa petiolum macula rotundata nigro signatis, petiolo elongato, tenui, nigro, striatulo; racemis ♂ supra-axillaribus, solitariis, simplicibus, vel geminis et inæqualibus; majore petiolo subbreviore.—In Africa tropica occidentali, *v. s. in herb. Hook.*; ♂ Bagroo River (Mann, 888).

This species has much the appearance of a *Tinospora*: its branchlets are  $\frac{3}{4}$  line diam., with internodes of  $4\frac{1}{2}$  inches; leaves 4 inches long from the apex to the basal lobes, or  $3\frac{1}{4}$  inches long to the basal sinus, and  $3\frac{1}{8}$  inches broad; the raceme is  $2\frac{1}{2}$  inches long. The floral structure corresponds with that of the preceding species.

#### 6. FIBRAUREA.

This genus, proposed by Loureiro in 1793, was not acknowledged by botanists till I pointed out its validity in 1851: the authors of the 'Flora Indica' have recognized the justice of this

claim, but they have not fully comprehended its true nature. I had rightly arranged the genus in the *Heterocliniæ*, but Drs. Hooker and Thomson placed it in the *Pachygoneæ*, under the conviction that a plant collected by them in the Khasya hills, which they named *Fibraurea hæmatocarpa*, belonged to the genus; in this conclusion they were undoubtedly mistaken, as their plant forms the type of a new genus (*Hæmatocarpus*), near *Pachygone*. There can be no mistake in regard to Loureiro's typical plant, for that exists in the British Museum, but unfortunately it has neither flower nor fruit; these desiderata, however, are found in other plants from Penang, Malacca, and Borneo. Although the fruit in one of these specimens is not quite matured, there is sufficient evidence to show that the genus is near *Tinomiscium*: it has an oblong drupe, with the style on its apex; its putamen is quite thin and smooth, flat on the ventral face, where the condylar process is an internal narrow longitudinal carinal projection, running from the base to the apex, to which the seed is attached near its summit. In its imperfect state, the enclosed seed is oval, nearly flat (by compression in drying), the albumen is not fully grown, but the incomplete embryo, with divaricated cotyledons, is sufficiently perceptible to show the nature of the structure. The above-mentioned authors repudiate the notion that the petals are agglutinated to the stamens, and say they have searched in vain for a confirmation of the fact; but how can we otherwise explain the nature of the projecting frill-like appendage, apparently part of a membrane that surrounds and seems to embrace the filaments; it is easy to insinuate a point some way down between that appendage and the anther-cells which it partly conceals. In *Anomospermum* each filament is enclosed within a free fleshy petal that entirely embraces it, leaving only the anther visible; and if we conceive these to be agglutinated together, we shall have precisely such a stamen as we find in *Fibraurea*: it certainly is not an established fact, although it is a fair inference, and we may expect to meet with the proof at some future time. All the plants I have referred to this genus coincide with Loureiro's specimen in a very peculiar feature: the two principal nerves which spring from the base are connate with the midrib, sometimes for half an inch in length, so that, technically speaking, they are triplinerved: the leaves are rather large, oblong, generally very coriaceous, the nervures are scarcely prominent on either side, the reticulated veins being wholly immersed, and hardly distinguishable, the petiole is rigid, very tumid at its apex, and still more swollen and tortuous at its base. The inflorescence is axillary, and in the male forms a very lax, wide-spreading panicle, as long as, or three times the length of the

petiole; but in the female the panicle is compounded only to the second degree, is more than twelve times the length of the petiole, with elongated patent branches, and rather long, distant, 1-flowered pedicels.

**FIBRAUREA**, Lour.—*Flores* dioici. *Masc. Sepala* 9, interdum 12, in ordine ternario imbricatim disposita, exteriora bractei-formia, 6; interiora multo majora, ovata vel oblonga, medio crassiuscula, margine membranacea et denticulato-erosa. *Petalata* nulla (nisi 6 carnosula filamenta amplectentia et iis arcte accreta). *Stamina* 6, inter se libera, centralia, fasciculata; *filamenta* crassa, subcompressa, subincurvata, infra antheram linea prominente transversali cincta, carinaque antica notata (an petala accreta?): *antheræ* oblongæ, coriaceæ, 2-lobæ, lobis paulo divaricatis, connectivo subimmersis, rima marginali utrinque dehiscentibus. *Ovaria* rudimentaria nulla. *Fœm. Petala* aut *stamina sterilia* 6, lineari-oblonga, obtusa, carnosula, ad basin gynæcii columnaris affixa, eo paulo longiora, sepalis 2-3-plo minora, erecta. *Ovaria* 3, summo gynæcii insita, gibboso-ovata, erecta: *stylus* nullus; *stigma* subexcentricum, e punctis globosis minutis, sessile. *Drupæ* 3, oblongo-ovatæ, subcompressæ, carnosæ, læves: *putamen* oblongum, compressum, dorso convexiusculum, ventre planius, et hinc sulco profundo longitudinali notatum, 1-loculare, 1-spermum; *condylus* e sulci duplicatura in carinam linearem fere ad centrum loculi protensa, internus et longitudinalis: *semen* loculo conforme: *integumenta* tenuia, linea longitudinali ventrali incrassata et hinc ad condylum adhærentia: *embryo* (e fructu immaturo adhuc vix plane visus) cotyledonibus foliaceis divaricatis, in albumine carnosio inclusus.

Frutices scandentes, in Asia intertropica, præsertim in insulis vigentes; folia ovata aut oblonga, acuminata, coriacea, glaberrima, triplinervia, longe petiolata; panicula axillaris, laxè et latissime expansa, ♀ longissima; drupæ flavæ.

1. *Fibraurea tinctoria*, Lour. Coch. ii. 769; Hook. & Th. Fl. Ind. i. 204;—Cocculus *Fibraurea*, DC. Syst. i. 525; *Prodr.* i. 99;—ramulis cortice lacerato, libro striato; foliis oblongis, imo rotundato-truncatis, e medio sensim acutis, apice longe acuminatis, acumine obtusiusculo, submembranaceis, utrinque glaberrimis, reticulatis, imo 3-nerviis, iterumque triplinerviis, longe petiolatis; drupis parvis, luteis (sec. Lour.).—China et Cochinchina, in herb. Mus. Brit. (Loureiro, sine flore aut fructu).

The specimen is valuable as the type of the genus; but it is in bad condition. The branchlets are covered with a smooth

peeling bark, beneath which they are striated; the leaves are  $5-7\frac{1}{2}$  inches long,  $2\frac{1}{4}-3\frac{1}{4}$  inches broad, the petiole being  $3\frac{1}{2}$  inches long; they are much more membranaceous, more reticulated, far more sharply acute, than in any of the following species; the two principal nerves are united with the midrib for a distance of half an inch from the base of the leaf; the petiole is slender and terete. From the branches the natives extract a colouring-matter, which is used as a yellow dye.

2. *Fibraurea chloroleuca*, n. sp.;—ramulis striatis, cortice coriaceo dissiliante; foliis ovato-oblongis, basi rotundatis, apice breviter et repente constrictis, acumine canaliculato recurvo submarginato, marginibus revolutis, coriaceis, glaberrimis, imo leviter 3-nerviis et longe ultra petiolum triplinerviis, supra viridibus, nervis paulo prominulis, eveniis, subtus chloroleucis, nervis prominentibus, venis transversis vix reticulatis; petiolo limbo fere dimidio brevior, apice tumido, basi valde incrassato et tortuoso; paniculis axillaribus, ♂ petiolo vix longioribus, latissime divaricatis, ramis rachi fere æquilongis et horizontaliter patentibus, ramulis sparsis, floribus majoribus, breviter pedicellatis; ♀ petiolo 5-plo longioribus, ramis petiolum æquantibus, patentim divaricatis, pedicellis breviusculis, 1-floris, demum drupiferis; drupis majusculis, subpollicaribus.—Malacca et Borneo, v. s. ♂ *in herb. Lemann.*, Malacca (Griffiths); Borneo (Barber, 284, 129; Motley, 153); ♀ *fructif. in herb. Hook.*, Tavoy (Griffiths).

This species differs from the preceding in its broader, more oval leaves, which are much more attenuated towards the apex, thick and coriaceous (not membranaceous), veinless (not reticulated), and it has larger fruits. The bark is of a greyish colour, smooth, thick, and coriaceous, and splits in parallel longitudinal fissures: in the Malacca specimens the leaves are 6-7-9 inches long,  $3\frac{1}{4}-3\frac{1}{2}-4$  inches broad, on a petiole  $2\frac{1}{4}-2\frac{1}{2}-3$  inches long; the ♂ panicle is compounded, about  $4\frac{1}{2}$  inches long, 5 inches broad, tapering upwards; its alternate primary slender branches, 3-5 lines apart, are expanded nearly at a right angle, and have alternate spreading branchlets, and the tertiary ramifications bear 2-3 flowers on pedicels 2 lines long, all quite glabrous. The fructiferous raceme is 16 inches long, its rachis 1 line diam., its branches 1-3 inches long, bearing pedicels  $\frac{1}{2}$  inch long, with a tumid apex supporting 1-3 drupes, which are 1 inch long,  $\frac{5}{8}$  inch broad when dried.

The specimens from Borneo form a variety (*elongata*), in which the leaves are much narrower, especially towards the base; the male panicle is longer, more racemose, with shorter branches, being 6-8 inches long, and  $2-2\frac{1}{2}$  inches broad.



3. *Fibraurea laxa*, nob.;—ramulis striatis, subfistulosis, cortice lævi, resiliente: foliis oblongis, apice acumine obtuso attenuatis, imo rotundatis, 3-nerviis, et mox triplinerviis, coriaceis, utrinque glaberrimis, fusco-viridibus, supra in nervis immersis sulcatis, minutissime ruguloso-punctulatis, subtus pallidioribus, nervis vix prominulis, eveniis: panicula ♂ laxa, longissima; rachi tenera, compressa, nitida, striata; ramis patentibus, rectiusculis, valde productis; ramulis teneribus, flores 3-6 breviter pedicellatos gerentibus; floribus minoribus.—Borneo, *v. s. in herb. Hook.* (Lobb).

This species is distinguished by its much darker, veinless, coriaceous leaves, gradually more attenuated, with a short obtuse acumen; they are 3-nerved as well as triplinerved, and have a much longer and very lax racemose ♂ panicle, twice or three times the length of that in the preceding species, with much smaller flowers. The leaves are about  $6\frac{3}{4}$  inches long,  $2\frac{3}{4}$  inches broad, the petioles being deficient. The male raceme is about 15 inches long; its lateral branches standing straight at a right angle, 3-4 inches long, about 1 inch apart, with short branchlets bearing few flowers; the flowers are smaller than in the foregoing species, the sepals shorter, darker, and more orbicular; the stamens shorter and more geniculated, with a more decided fringe-like appendage.

4. *Fibraurea fasciculata*, nob.;—ramulis subangulatis, cortice lacerato; foliis ovalibus, apice breviter et repente attenuatis, acumine obtuso emarginato, imo distincte 3-nerviis, et longe intra marginem triplinerviis, coriaceis, glaberrimis, supra lucidis, læte viridibus, ruguloso-punctulatis, eveniis, subtus pallidioribus, nervis subprominulis; petiolo limbo fere 3-plo brevior, imo tortuoso apiceque tumido; racemis plurimis (circa 10), simplicibus, gracilibus, petiolo vix duplo longioribus, glaberrimis, e nodo supra-axillari fasciculatim enatis; floribus minoribus.—Penang, *v. s. in herb. Hook.* (Phillips).

This plant differs from all the foregoing in its more oval leaves, and is extremely distinct in its many fasciculate and almost simple spicate racemes. After the manner of most of the genera throughout the family, the leaves in all the species have a similar texture and nervation, and bear the same general appearance; and this circumstance has induced the authors of the 'Flora Indica' in this case to mass all the above species into one, making them identical with Loureiro's typical plant. The differences between them are, however, sufficiently manifest: the leaves here are  $5\frac{1}{2}$  inches long,  $2\frac{3}{4}$  inches broad, on a petiole 2 inches long; the slender racemes, 3 inches long, are quite

simple above, but shortly branched in the lower moiety, where the peduncles, only 3 lines long, bear a few pedicellated flowers; the upper ones are simply 1-flowered, and 2 lines long; the flowers, as in the last species, are smaller than in the preceding.

#### 7. TINOMISCIUM.

When I proposed this genus in 1851, it was placed by me among the genera of doubtful position, because its male flowers alone were known; but I suggested the probability of its belonging to the *Heteroclinia*, on account of its habit. The authors of the 'Flora Indica' (p. 205) adopted a similar view, and, though retaining it among the "genera dubiæ sedis," remarked that a plant in fruit from Assam, of Griffiths's collection, described by them in p. 179, probably belonged to the genus. This I had long before ascertained from a specimen in fruit shown to me by the late Dr. Lemann, where the seeds showed clearly that the genus belongs to the *Heteroclinia*, as I had supposed. The drupe is more than an inch in length, with a nearly apical style; its thin rugose putamen has a broad, shallow, longitudinal groove on the flattened ventral face; and from this (the condyle) the seed is suspended, or rather is attached to it within the cell: from the immaturity of the nucleus, the precise form of the embryo could not be ascertained; but its thin foliaceous cotyledons were evident in the half-grown albumen, and in these respects it nearly accords with the fruit of *Fibraurea*. The species are all climbers; and the inflorescence consists of elongated slender simple racemes, either single or fasciculated, in the axils of the leaves.

TINOMISCIUM, nob.—*Flores* dioici. *Masc. Sepala* 9–12 in ordine ternario alternatim disposita, quorum 6 interiora, oblonga, extus scabrido-pruinosa, æstivatione imbricata. *Petala* 6, oblonga, sepalis paulo breviora, submembranacea, marginibus involutis. *Stamina* 6, petalis opposita, subæquilonga, et iis (in alabastro) amplecta, demum libera; *filamenta* gradatim incrassata, aut apice dilatata; *antheræ* introrsæ, 2-lobæ, lobis oblongis, immersis, parallele adnatis, aut divergentibus, rima obliqua dehiscentibus. *Ovaria* rudimentaria 3, centralia, punctiformia.—*Fœm.* ignoti. *Drupæ* 3 vel abortu pauciores, ovali-oblongæ, compressæ, styli vestigio apiculatæ: *putamen* oblongum, valde compressum, scrobiculato-tuberculatum, coriaceo-testaceum, dorso convexius, et hinc carina subobsoleta notatum, ventre planius, sulco longitudinali late canaliculatum, 1-loculare, 1-spermum; *condylus* internus, obsoletus, aut potius in striam sulcatam longitudinalem reductus; *integumenta* tenuia, ventre linea longitudinali incrassata signata,

et hinc in striam insinuata: *embryo* (e fructu immaturo adhuc vix distinguendus) in *albumine* carnoso inclusus.

Frutices *scandentes*, in *Asia tropica*, *præsertim in insulis*, *vigentes*; folia *magna*, *ovata*, *acuminata*, *coriacea*, *3-nervia*, *sæpè glabra*, *longe petiolata*: *racemi plurimi vel solitarii*, *supra-axillares*, *simplices*; *flores breviter pedicellati*.

1. *Tinomisium petiolare*, nob., Ann. Nat. Hist. ser. 2. vii. 44; Flor. Ind. i. 205;—*Cocculus petiolaris*, *Wall. Cat.*;—*Cocculus coriaceus*, *Hook. MSS. (non Bl.)*;—ramulis teretibus, spirally sulcato-striatis, cortice cinereo, rimoso: foliis amplis, ovato-oblongis, apice subito angustatis et acuminatis, imo subrotundatis breviter 2-sinuatis et hinc circa petiolum breviter productis, coriaceis, utrinque glaberrimis, 3-5-nerviis; supra opacis, subpallidis, minutissime striatulis, et quasi in lineis creberrimis insculptis; subtus brunnescenti-opacis, nervis venisque transversis prominentibus: petiolo subtenui, elongato, canaliculato, striato, apice paulo crassiore, imo tortuoso et valde tumefacto: racemis ♂ 3-4 vel pluribus, e nodo supra-axillari, fasciculatis, simplicibus, tenuibus, latericeo-pilosis, petiolo 2-4-plo longioribus; floribus numerosis, breviter pedicellatis et bracteatis; racemo ♀ fructifero stricto, petiolo 2-plo longiore.—India orient., v. s. ♂ in *herb. Soc. Linn.*, Penang (*Wall. Cat.* 4964); in *herb. Hook. et Lindl.*, Penang (sub nom. *Coc. coriacei*); ♀ fructif., Assam (*Griffiths*, 575).

This is said to be a climbing plant from the hills, emitting a white milky juice. Its branches are 3-4 lines diam., with internodes of about  $2\frac{1}{2}$  inches; the leaves are  $4\frac{1}{2}$ - $6\frac{1}{2}$  inches long, 3-4 inches broad, with a petiole  $3\frac{1}{2}$ -4 inches long. From three to six very slender racemes issue from a knotty prominence a little above the petiole; they are 5-10 inches long, covered with a red-brown tomentum; the 1-flowered pedicels, supported by a linear pubescent bract of equal length, are 1 line long; the six inner sepals are oblong, acute,  $1\frac{1}{2}$  line long, scabridly tomentose outside, fleshy, with erosely denticulated margins; the petals, about 1 line long, have their straight lateral margins involuted; the anther-lobes, imbedded in the apex of the filament, open introrsely by oblique fissures, and curve back in dehiscence; in the centre are three punctiform indications of sterile ovaries upon a small central elevation.

2. *Tinomisium Javanicum*, nob., l. c. 44;—*Cocculus coriaceus*, *Bl. (non Hook.) Bijl.* 25?; *Walp. Rep.* i. 93;—ramulis teretibus, substriatis, tomentosis; foliis amplis, latissime obovatis, imo truncato-cordatis vel 2-sinuatis, apice breviter acutis vel attenuatis, coriaceis, 5-nerviis, supra nitidis glabrisque, subtus

opacis et in nervis venisque transversis tomentosis; petiolo longissimo, imo torto et tumido, apice paulo incrassato; racemo dependente, simplici, supra-axillari, longissimo, gracili, tomentoso; floribus majoribus, subvaxis, breviter pedicellatis.—Java, v. s. ♂ in herb. de Boissier (Zollinger, 745); in herb. Mus. Brit. et Hook. (Horsfield).

In Zollinger's specimen, the branchlet is 3 lines diam., with internodes of  $5\frac{1}{2}$  inches; the leaves are of a dark green colour,  $8\frac{1}{2}$  inches from the bottom of the basal lobes (or  $7\frac{3}{4}$  inches from the summit of the petiole) to the apex, and 7 inches broad; the petiole, 6 inches long, very tumid, and spirally tortuous at base, gradually swelling at the apex; the slender pendant raceme is 10 inches long, is bare of flowers for nearly half its length; the alternate pedicels, about 4 lines apart, are 1 line long, and the flowers expanded are 4 lines diam.; the three outer bracteiform sepals, covered with reddish hairs, are 1 line long, the six more internal sepals are linearly oblong, acute, revolutely expanded, 2 lines long,  $\frac{1}{2}$  line broad, with membranaceous margins, and are scabridly pruinose outside; the six petals are erect, about  $1\frac{1}{2}$  line long, with involute margins and apex, thus almost hooding the stamens, which are of equal length; the filaments are fleshy, gradually thickening upwards, the oblique anther-lobes being intorsely immersed in their summit. In Horsfield's specimens the leaves are somewhat smaller.

#### 8. BURASIA.

This genus, proposed by Du Petit Thouars in 1806 for some Madagascar plants, was included with much hesitation in the *Lardizabalaceæ* by Prof. Decaisne, in his excellent monograph of that family, his doubts being founded on the minute size of its flowers, the absence of sterile ovaria in the male plant, its introrse anthers, its fertile ovaries having only a single ovule, the cotyledons of its embryo being large, foliaceous, and divaricately placed in distinct cells of the albumen—characters quite opposed to *Lardizabalaceæ*; but the consideration of its distinctly 3-foliolate leaves, and of the seed being invested by a papillose viscous envelope, preponderated in favour of its position in the former family. I believe I was the first to determine its true affinity, in my 'Notes on *Menispermaceæ*,' in 1851, when it was placed in my tribe *Heterocliniæ*. Lately, however, the authors of the new 'Genera Plantarum' have removed it from that tribe without stating their reasons, and with seeming contradiction have placed it in a doubtful position at the tail of the *Pachygoneæ*, acknowledging at the same time the conformity of its embryo with that of the *Heterocliniæ*! After the publication of my

“ remarks ” above stated, I had an opportunity of examining the typical specimen in the Paris herbarium ; and though it has only male flowers, the parts accord so well with those of the *Heterocliniæ*, that, having regard also to the details given by Du Petit Thouars and Decaisne respecting the structure of the fruit and seed, I have no hesitation whatever in retaining the genus in the position I had long ago assigned to it. The careful examination of the specimen of another species in the British Museum has since confirmed this decision. The genus is certainly singular in having 3-foliolate leaves ; but it must be remembered that throughout the family they are most frequently 3-nerved, and that the leaves of *Jateorhiza* and *Calycocarpum* offer a near approach to those of *Burasaia* in being deeply 3-5-lobed : we know that similar grades of division are common in many families : it appears, indeed, that in *B. gracilis* the terminal leaves are sometimes 3-lobate. The papillose viscous covering that enwraps the putamen is evidently analogous to the short tomentum imbedded in a pulpy mesocarp seen in *Jateorhiza*, *Odontocarya*, and *Hæmatocarpus*, and the fleshy envelope in *Anomospermum*. The description given of the form of its embryo is precisely that found only in the *Heterocliniæ*. From evidence collected from all sources, which appears to me undeniable, the following generic character has been formed.

BURASIA, Thouars.—*Flores* dioici. *Masc. Sepala* 6, ovalia, concava, 2-serialia, 3 exteriora minora. *Petala* 6, oblongo-ovata, breviter unguiculata, carnosæ, 2-serialia, exteriora paulo majora, apice eroso-denticulata. *Stamina* 6, petalis opposita : *filamenta* carnosæ, subbrevia, gradatim incrassata, apice geniculato-clavata : *antheræ* oblongæ, introrsæ, 2-lobæ ; lobis adnatis, imo paulo divaricatis et subimmersis, horizontalibus, rima laterali utrinque dehiscentibus. *Ovaria* rudimentaria nulla.—*Fœm.* (char. ex cl. Decne.) *sepala et petala* ut in masc. *Stamina* abortiva 6. *Ovaria* 3, gibbosa, 1-locularia, *ovulo* unico angulo ventrali appenso. *Stigma* sessile, truncatum. *Drupæ* 3, carnosæ, supra gynæcium auctum insitæ, ovatæ : *putamen* papillis tectum, mesocarpio viscoso indutum, ovatum, plano-convexum, 1-loculare, *condylo* concavo in loculo protenso : *embryo* intra *albumen* copiosum fere rectus ; *cotyledonibus* planis, foliaceis, in locellis distinctis divaricatis ; *radicula* supera, stigma spectante.

Frutices *Madagascarienses*, *glabri*, cortice *rimoso* ; folia *longe petiolata*, *palmatim* 3-foliolata, foliolis *ovatis lanceolatisve*, *integerrimis*, *coriaceis* ; racemi *pauci*, *axillares*, *fasciculati*, floribus *parvis*, *breviter pedicellatis*.

1. *Burasaia Madagascariensis*, Thouars, Gen. Nov. Madag. p. 18 ;

Dict. Sc. Nat. v. 266; Dene. Arch. Mus. i. 198, t. 13. fig. c; —glaberrima; foliis longe petiolatis, 3-foliolatis; foliolis oblongis, utrinque acutis, apice attenuatis et mucronulatis, lateralibus imo inæquilateris, coriaceis, supra nitidis, utrinque pallidis, impresso-punctatis, penninerviis, nervis brevibus inter se arcuatis omnino immersis et hinc sulcatis, aveniis, petiolo brevissimo; racemis axillaribus, 4, fasciculatis, alternatim pedicellatis; pedicellis brevibus, 1-floris.—Madagascar, v. s. in herb. Mus. Paris. (Thouars).

The drawing I made of this plant, together with my notes, were lost; but I owe to the kindness of M. Decaisne a loose leaflet and raceme, which have enabled me to make out the above diagnosis; the leaflet is  $3\frac{1}{2}$  inches long,  $1\frac{1}{4}$  inch broad, with an attenuated apex 3 lines long,  $1\frac{1}{2}$  line broad; it is inequilateral at base, and fixed on a petiolule 1 line long; it has six diagonal nervures on each side, 3–5 lines long, arching together, quite sunk in the parenchyma, and sulcated equally on both sides; the racemes, four out of each axil, are quite smooth, 2–3 inches long; the pedicels are 1–2 lines long, bracteated at base, bearing a globular flower in bud, 1 line diam.

2. *Burasaia gracilis*, Dene. loc. cit.;—foliis ternatis, foliolatis, lanceolatis, acuminatis, basi in petiolum attenuatis, subaveniis, in terminalibus interdum 3-lobatis; racemis pedicellisque elongatis, gracilibus, folium superantibus.—Madagascar.

3. *Burasaia congesta*, Dene. loc. cit.;—ramulis crassiusculis, teretibus, cortice lævi, cinerascete: foliis mediocriter petiolatis, 3-foliolatis; foliolis oblongis vel lanceolatis, apice brevissime et repente attenuatis, acumine obtuso, imo subacutis, lateralibus oblique inæqualibus, terminali majore, subcoriaceis, utrinque nitidis et glaberrimis; supra impresso-punctulatis, nervis pinuatis immersis; subtus pallidioribus, nervis teneribus vix prominulis: petiolo valde compresso, nitido; petiolulis brevissimis, canaliculatis: racemis simplicibus, 3–4, in axillis fasciculatis, folio brevioribus; floribus sparsis, breviter pedicellatis.—Madagascar, v. s. in herb. Mus. Brit.; “Ambourasinha” (Thompson).

The above specimen, though not in good condition, agrees sufficiently with the diagnosis of Prof. Decaisne, and has enabled me to amplify its characters. The branch, covered with a smooth grey bark, is  $\frac{1}{4}$  inch diam., with internodes of  $\frac{1}{2}$ – $\frac{3}{4}$  inch; the terminal leaflets, always larger, are  $3\frac{1}{4}$ – $4\frac{1}{2}$  inches long,  $1\frac{3}{8}$ – $1\frac{5}{8}$  inch broad, on a petiolule 3 lines long; the lateral leaflets are  $2\frac{1}{2}$ –3 inches long,  $\frac{7}{8}$ – $1\frac{1}{4}$  inch broad, on petiolules 2 lines long; the racemes have a slender compressed glabrous rachis, about

4 inches long, with alternate pedicels  $1-1\frac{1}{2}$  line long; the flowers have eighteen sepals, of which the six more internal are ovate and 1 line long; the petals, half their length, are six, in two series, of which the inner three are 2-auriculate at base.

#### 9. ANAMIRTA.

This genus was proposed in 1819 by Colebrook for the typical species, of which he had only seen the male plant: the male and female plants were afterwards described, with more precision, and figured by Dr. Arnott: but there are some few inaccuracies in those details; for the anthers in the male flower are aggregated upon a scarcely elevated receptacle, not raised upon a stipitated column, as is there shown, and in the female flower the monadelphous ring of 10 sterile stamens is altogether overlooked, as is likewise the 5-lobed raised gynæcium. *Anamirta* resembles *Parabana* in the aggregation of its numerous stamens upon a receptacle, their number varying in different species from 15 to 55. It is stated by Dr. Arnott, as well as by the authors of the 'Flora Indica,' that the female flower bears 3 ovaries; I have found constantly 4 or 5, and have never met with a smaller number in the many flowers I have examined. The normal number would seem to be 5, judging from the proportion of the sterile stamens that surround them, these being invariably 10, in a single series, united in an annular ring (not 9, as stated by those authorities). The number of sepals is inconstant in the same panicle of flowers, varying from 7 to 12, including 3 minute basal bracts, which also vary in number and size; they are much imbricated. There are no petals. The drupes are fleshy and gibbously oval, the persistent stigma being very excentric, and much nearer the base than the apex: here the gynæcium by subsequent growth is converted into a stout cylindrical carpophorum\*, which becomes divided at its summit into 2, 3, or 4 forks, answering to the number of drupes perfected, leaving cicatrices corresponding with the number of abortive ovaries—a development similar to that I have described in *Tiliacora* and *Sciadotenia*. The putamen is oval, with a short reniform sinus on its ventral face; it is of a thin corneous texture, its smooth surface is grooved in a net-like form, the grooves being filled with capillary fibres, from which it may be inferred that in a fresh state its mesocarp consists of aggregated masses like those observed in *Anomospermum*; on the side of the reni-

\* It would be well to confine the use of the term *carpophorum* to those kinds of development resulting from the growth of the torus, leaving the word *carpodium* to designate the stipitate support where it is an increment of the fruit itself.

form depression of the putamen, there are two small circular apertures leading into two distinct chambers of the large sub-globular condyle, which projects far into the centre of the cell, and the integuments of the seed enter into the deep groove along its face, and are there firmly attached along the line of the raphe. The structure of its seed quite corresponds with the rest of the *Heterocliniæ*, but the fissures of the ruminated albumen do not penetrate so deeply as in many genera: the cotyledons are extremely divaricated, and enclosed in distinct cells of the albumen.

The authors of the 'Flora Indica' acknowledge only the original type, but *A. lemniscata* from Java, as well as several others here described, are distinct species; they do not admit *A. flavescens*, which appears to me correctly referred here by Wight and Arnott, and they regard the Ceylon species, *A. toxifera*, as being identical with the type; but the grounds on which they are considered distinct are fully stated. Concerning *A. Bauerana* of Endlicher, I can learn nothing: it is figured in his 'Atakta'—a book I have not been able to consult, nor can I find in any botanical work a description of the species.

ANAMIRTA, Coleb.—*Flores* dioici. *Masc. Sepala* 7–12, imbricata, quorum 2–4 exteriora minora, ovata, concava, submembranacea. *Petala* nulla. *Stamina* 15–55, receptaculo parvo sessili, pluriseriatim in globum aggregata: *filamenta* fere obsoleta: *antheræ* 4-lobæ, sub-4-locellatæ, rima transversa 2-valvatis hiantes.—*Fœm. Sepala* ut in masc. *Petala* nulla. *Stamina* sterilia 10, brevissima, carnosula, compressa, apice emarginata, effœta, imo in anulum brevem circa gynæcium coalita. *Ovaria* sæpius 4 vel 5 supra gynæcium breviter cylindricum imposita, erecta, gibba, glabra, 1-locularia, *ovulo* unico in angulo ventrali appenso. *Stylus* brevissimus, crassiusculus. *Stigma* validum, subito reflexum, deltoideum, convexum, papillosum. *Drupæ* 1–5, ovatæ, subcarnosæ, stigmatibus valde excentricis notatæ, carpophoro longiusculo lignoso incrassato cylindrico apice furcato suffultæ, furcis tot quot drupis, iisdem articulatis: *putamen* ovatum, ad ventrem reniformi-excavatum, tenuiter osseum, 1-loculare, sutura peripherica, sub-2-valvare, indehiscens; *condylus* omnino internus, majusculus, globosus, 2-cameratus, ultra medium loculi protensus, foraminibus 2 collateraliter se junctis externe apertis instructus. *Semen* loculo conforme, meniscoideum, facie ventrali valde cavum, et hinc ad condylum affixum: *integumenta* tenuissima, per *raphem* linearem ventralem sulco condyli intrusa: *embryo* paulo convexus, intra albumen copiosum fere 2-laminare ventre ruminatum inclusus: *cotyledones* tenuiter foliaceæ, lineari-oblongæ,



lateraliter valde divaricatæ, in locellis sejunctis sepultæ, *radicula* brevi tereti supera axin versus inclinata et ad stylum spectante multoties longiores.

Frutices *scandentes Indiæ orientalis et Insularum incolæ, sæpius glabri*, cortice *suberoso*; folia *majuscula, late ovata, sæpe cordata, integerrima, subcoriacea, longe petiolata*; paniculæ *racemosaë, supra-axillares, elongatæ, pendulæ*; flores *pedicellati, pedicellis basi et medio 3-bracteatis*.

1. *Anamirta paniculata*, Coleb. Linn. Trans. xiii. 66;—A. Cocculus, *W. & A. Prodr. Fl. Pen. Or.* 446; *Ann. Sc. Nat.* ii. 69, tab. t. 3, ♂ ♀; *Hook. & Th. Fl. Ind.* i. 385;—Cocculus suberosus, *DC. Syst.* i. 519, *Prodr.* i. 97; *Coleb. l. c.* 63; *W. & A. l. c.* i. 11;—Cocculus lacunosus, *DC. l. c.* 519;—Menispermum Cocculus, *Linn. (in parte)*, sp. 1468; *Gaertn.* i. 219, tab. 70. f. 7; *Wall. As. Res.* xiii. 403 (*non Roxb.*);—Menispermum lacunosum, *Lam. Dict.* iv. 98;—Menispermum heteroclitum, *Roxb. Fl. Ind.* iii. 817;—Menispermum monadelphum, *Roxb. Cat. Merc. Ang. Ind. Or.* tab. 130, ♂;—Cissampelos Cocculus, *Poir. (in part.) Dict.* v. 9;—Natsjatom, *Rheede, Hort. Mal.* vii. tab. 1;—ramulis teretibus striatis, cortice cinereo, suberoso, rimoso, subtuberculato; foliis rotundato-ovatis vel orbiculatis, cordatis, subacutis, coriaceis, firmis, 5-nerviis, supra glabris, pallidis, lucidis, rugulosis, in nervis immersis sulcatis, infra pruinoso-candicantibus, glabris, nervis grossis prominentibus, in axillis nervorum venarumque barbatis; petiolo angulato-striato, imo apiceque incrassato, limbo dimidio brevior; paniculis racemosis, supra-axillaribus, elongatis, pendulis, glabris, rachi angulato-striata, rufescente, ramis longiusculis; sepalis subinæqualibus, ovatis, margine eroso-ciliatis; staminibus 30–35.—In India orientali, *v. s. in herb. Soc. Linn.* ♂ et ♀, *Wall. Cat.* 4954; *in herb. Mus. Brit. et Hook.*

The specific name of Colebrook certainly claims priority (1819) over that of Wight and Arnott (1834), the latter having been adopted by the authors of the 'Flora Indica.' In the native specimens the leaves are 4–6 inches long, the same in breadth, on a petiole 3–5 inches long; they are rigid, quite glabrous beneath, though opaque, yellowish, and pruinose, with tufts of white hairs in the axils of the nerves, which are coarse and prominent; they are apiculated and bent back at the apex, and the margins are scarcely revolute; the male raceme is 10–14 inches long; its lateral branches 1 inch long, with pedicels 2–3 lines long; the fructiferous racemes are 6–8 inches long, with thick divaricated pedicels 3–5 lines apart, 5 lines long, carpophorum thicker than pedicel, sulcated, 3–4 lines long, with generally two very

divaricated forked branches  $1\frac{1}{2}$  line long, each supporting a drupe 5 lines in diameter, which is of a reddish hue, with a somewhat scrobiculated surface. In the Wallichian Herbarium, under no. 4954, are specimens of a more luxuriant growth cultivated in the Botanic Garden of Calcutta: here the leaves are almost coriaceous, very deeply cordate, oblong, and suddenly attenuated at the apex by a short narrow acumination; they are 8 inches long,  $7\frac{3}{4}$  inches broad, the deeply sulcated petiole being thick, and  $4\frac{3}{4}$  inches long; the panicle is 11 inches long, on a slender rachis  $\frac{1}{2}$  line in diam., with lateral branches  $1\frac{1}{2}$ –2 inches long, bearing numerous approximated flowers on pedicels 2 lines long.

2. *Anamirta flavescens*, nob. ;—*Anamirta cocculus*, *W. & A. (in parte) l. c.* 446; *Hook. & Th. (in parte) l. c.* i. 385;—*Cocculus flavescens*, *DC.* i. 520; *Prodr.* i. 97;—*Menispermum flavescens*, *Lam. Dict.* iv. 98;—*Menispermum Cocculus*, *Roxb. (non Linn.)*;—idem, *Linn. (in parte)*;—*Tuba flava*, *Rumph. Amb.* v. 38, tab. 24;—ramulis crassiusculis, teretibus, striatis, ligno flavido; foliis ovatis, vel oblongis, imo truncatis vix cordatis, gradatim subacutis, acumine obtusiusculo, margine valde revoluto, flaccidis, glabris (junioribus suborbicularibus cano subpubescentibus), 5-nerviis, supra pallide viridibus, valde convexis, ruguloso-opacis, ad nervos immersos profunde sulcatis, et inter nervos basales ubi junctos pulvino subgloboso majusculo donatis, subtus glauco-pallidis, nervis venisque prominentibus et in axillis barbatis; petiolo longissimo, tenui, striato, imo longe incrassato et subito deflexo, limbo æquilongo; panicula ♂ supra-axillari, folio 2-plo longiore, rachi crassiuscula, striata, ramis longiusculis, multifloris, floribus pedicellatis, albis, odoriferis; drupis sordide flavis.—Moluccæ in saxis maritimis, *v. s. in herb. Soc. Linn.*; *Wall.* no. 1225, in *H. B. Calc. cult.* A.D. 1817, sub nom. *Menisp. Cocculus*, *Roxb.*

This species is considered identical with the preceding by the authors of the 'Flora Indica;' but, although it corresponds in general habit and in the nature of its seeds, it differs in many essential respects. Dr. Roxburgh describes them as two distinct species, both growing, in his time, in the Botanic Garden of Calcutta, where he had the opportunity of comparing them: to the former he gave the name of *Menispermum heteroclitum*, to the latter *M. Cocculus*. DeCandolle and Lamarck respectively detail their characters as distinct species. Dr. Arnott also remarks (*Ann. Sc. Nat.* ii. 267) that *Anamirta racemosa*, *Coleb.*, is the same as *Cocculus suberosus*, *DC.*, and *M. heteroclitum*, *Roxb.*, but is different from the *M. Cocculus*, *Roxb.* Gaertner also regarded the Natsjatan of the Hort. Malab. as the *Cocculus officinalis*, and different from the *M. Cocculus*, *Linn.*;

he thus considered the *Cocculus* of commerce to be the growth of two distinct species. This again is confirmed by Dr. Wallich, who preserved separate specimens, some under the name of *Cocculus suberosus*, DC. (Cat. 4954), others, without number, dated 1817, which he designated *C. flavescens*, DC., and *M. Cocculus*, Roxb., both from the Botanical Garden of Calcutta. These last specimens, which I have seen, fully harmonize with the conclusions of all these authorities. In the latter species the leaves are much larger, more oblong, broadly truncated at base (not cordate), diminishing gradually from the middle towards a narrow acuminate and emarginated apex (not roundly ovate and obtusely narrowed); they are not coriaceous, are dull pale green above, with immersed nerves and veins, greatly convex on the upper surface (not flat), with very revolute margins, are 10 inches long, 7 inches broad, on a smooth and unusually slender petiole  $8\frac{3}{4}$  inches long, with an elongated tumid swelling at its base nearly an inch in length.

3. *Anamirta toxicifera*, nob.;—*Anamirta cocculus* (*in parte*), *H. & Th. l. c.* 185;—ramulis teretibus, striatis, glabris; foliis late ovatis, fere rotundatis, imo truncatis, vix cordatis (in ♀ bisinuato-obtusis), e medio sursum angustioribus, apice subacutis, 3–5-nerviis, utrinque glabris, supra in nervis sulcatis, rugoso-punctatis, subtus stramineo-pruinosis, nervis (in axillis barbatis) venisque transversis subprominentibus, petiolo angulato-striato, limbo fere æquilongo, apice vix tumido, imo longe incrassato et torto; panicula ♂ spicatum racemosa, glaberrima, rachi compressa, striata, basi nuda, dehinc ramosa, floribus in ramis subspicato-agglomeratis, pedicellis brevissimis, imo bibracteolatis, bracteis infra flores 2–3; sepalis 8, glaberrimis, quorum 4 exterioribus pallidis, margine late membranaceis, 4 interioribus subæqualibus, valde carnosis, coloratis; staminibus circiter 60, in globum aggregatis; racemo ♀ fructifero simplici, folio (adjuncto petiolo) subæquilongo, pedicellis longis, patentibus, 1-floris; carpophoro longiusculo 2–4-furco; furcis sublongis, suberectis, singulis drupiferis, putamine pisi magnitudine.—In Ceylon, *v. s. in herb. Hook. et Mus. Brit.*, ♂ (Gardner), ♂ & ♀ (Thwaites, 2722).

The above characters show this to be distinct from the two preceding: its leaves have quite a different aspect from those of *A. paniculata*; but the authors of the 'Flora Indica' have passed it over as belonging to the typical form. The leaves of the ♂ plant are much broader, truncate and scarcely cordate at base,  $5\frac{1}{4}$ – $6\frac{3}{4}$  inches long,  $5\frac{3}{4}$ –6 inches broad, with a petiole 4 inches long; in the ♀ they are more oblong, and somewhat cuneately 2-sinate at base, they are  $5\frac{1}{2}$  inches long,  $4\frac{1}{2}$  inches broad, on

a petiole  $4\frac{1}{2}$  inches long; there is no pulvinate swelling at the basal junction of the nerves. The ♂ raceme is 8 inches long, its branches (1–2 inches long) bearing very numerous flowers crowded together in a spike-like form; each ♂ flower has about fifty stamens aggregated in a sessile globular head. The ♀ or fructiferous raceme is 10 inches long; its alternate spreading pedicels are 9 lines long, and bear at their summit a carpophorum 3 lines long and two erect forks 2 lines long, all being longer and more slender than in the typical species: alternate with the two forks are two other short ones with a cicatrix at the apex, showing that the progress of their growth had been arrested at the time when the abortive ovaries fell off; the two longer forks each support a drupe whose putamen is 5 lines long and 4 lines in diam.

4. *Anamirta populifolia*, nob.;—*Cocculus populifolius*, DC. *Syst.* i. 519, *Prodr.* i. 97; *Dcne. Tim.* 95;—*Anamirta Cocculus* (*in parte*), *Hook. & Th. l. c.* 185;—*glaberrima*, foliis late ovatis, cordiformibus, acuminatis, integris, penninerviis; petiolo elongato, imo torto; panicula ♀ ampla, ramosa, multiflora, floribus pedicellatis; drupis 1–3, subglobosis, putamine pisco paulo majore.—In Timor, *v. s. in herb. Mus. Par.*

The notes I made on examining the original specimen in the Paris herbarium are unfortunately mislaid, and I have only to refer to the above character given by DeCandolle, who describes the leaves to be of thinner texture, in size and shape like those of *Populus angulatus* (6–10 inches long, and of equal breadth). The panicle is large, much branched, with slender, striated, glabrous ramifications bearing pedicels at intervals of 4 lines, most of which have fallen off; the persistent pedicels are 4 lines long, bearing a more slender carpophorum, 2 lines long, and a branching drupiferous fork, 2 lines long, at the foot of which three cicatrices denote the places of the abortive ovules that have fallen off. The putamen is 5 lines long, and of a reddish colour, while that of the typical species is larger, and becomes nearly black when dry: the internal structure is quite conformable with the characters of the genus. As in the two preceding instances, this plant is confounded with the typical species by the authors of the 'Flora Indica.'

5. *Anamirta lemniscata*, nob.;—*glaberrima*; ramulis subangulatis; foliis ovato-oblongis, aut ovatis, imo latissimo bisinuato-obtusis, apice acutis, breviter attenuatis et mucronatis, submembranaceis, siccitate fusciscentibus, e basi 7-nerviis, nervis tenuibus extrorsum nervosis, vix prominentibus, utrinque glabris, subtus pallidioribus et nervis in axillis barbatis;

petiolo gracili, tereti, substriato, glabro, limbo paulo brevior, imo torto apiceque tumido; panícula ♂ racemosa, graciliter elongata, supra-axillari, glabra, nigrescente, ramis divaricatis, tenuiter longis, subflexuosis; floribus parvis, imo bracteolatis, spicatum sessilibus et alternatim dispositis.—In Java, *v. s. in herb. DeCandolle*. (Zollinger, 2335).

This species is very distinct from any of the preceding; for, in the size and shape of its leaves, its elongated petiole, and its very long, slender, pendent racemes, it greatly resembles *Tinomisium Javanicum*: its smooth branches are  $1\frac{1}{2}$  line in diam., with internodes of  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch: the larger leaves are 8 inches long, 6 inches broad, with a petiole  $\frac{1}{2}$  line in diam. and 6 inches long: the younger leaves are more distinctly bisinuate at base, with a longer, narrower, and more obtuse lobe about the petiole; they are more acute at the apex, of very thin texture, almost veinless, fuscous above, dark brown beneath,  $4\frac{1}{4}$ –5 inches long,  $2\frac{1}{2}$ – $2\frac{7}{8}$  inches broad, on a petiole  $3\frac{1}{2}$ – $4\frac{1}{2}$  inches long. The glabrous raceme-like panicle is 18 inches long, on a slender rachis, with delicate flexuose branchlets 2–3 inches long and  $\frac{1}{2}$ – $\frac{3}{4}$  inch apart, bearing numerous alternate approximate flowers, which are quite sessile and  $\frac{3}{4}$  line in diam. in bud: these have three acute bracts (1 inferior tuberculate at base, 2 lateral membranaceous), five equal outer sepals, and three others internal and somewhat smaller, all oblong, acute, very fleshy, quite glabrous, with narrow membranaceous eroso-ciliate margins, eleven to fifteen stamens, with almost sessile 4-lobed anthers, aggregated in the centre into a globular head.

6. *Anamirta luctuosa*, nob.;—ramulis fuscis, valde striatis, glabris; foliis late ovatis, imo cordatis, e basi sensim paulo angustioribus, apice breviter acutis, fusco-nigrescentibus, imo 5-nerviis, supra glabris, nitidis, subtus opacioribus, nervis tomentellis in axillis obsolete barbatis; petiolo subtenui, limbo fere æquilongu, striato, glabro, imo torto et longe tumido.—In Java, *v. s. in herb. Mus. Brit. sine flore* (Horsfield).

This plant is evidently allied to the preceding species, but differs in many respects. Its leaves are extremely dark and shining, subcoriaceous, 6 inches long,  $4\frac{5}{8}$  inches broad, on a petiole  $5\frac{1}{2}$  inches long.

7. *Anamirta jucunda*, nob.;—glaberrima, ramulis striatis; foliis majusculis, late ovatis, imo cordatis, summum versus gradatim acutioribus, apice breviter recurvo et mucronulato, subpallidis, subcoriaceis, imo 5-nerviis, supra lævissimis, nervis subimmersis, et hinc, ubi junctis, pulvino globoso donatis, subtus

pallidioribus, sublucidis, nervis flavidis, subcarinatis, prominentibus, venis reticulatis immersis, glandula cava in axillis nervorum sæpe pilosa; petiolo striato, rigido, glaberrimo, apice crassiore, imo longe et valde tumido, subito reflexo.— In Java, v. s. in herb. Mus. Brit. sine flore (Horsfield).

A species very distinct from the two preceding, differing in its more coriaceous, paler, and more oval leaves, in the venation, and its much shorter petioles. They are  $7\frac{1}{2}$  inches long, with a basal sinus 3 lines deep,  $6\frac{1}{4}$  inches broad, on a petiole  $4\frac{3}{4}$  inches long. Besides the basal nervures, they have five pairs of nearly opposite pinnate nerves, the chief basal pair being externally branched.

*Species dubia.*

*Anamirta Bauerana*, Endl. Atakt. Bot. tab. 39, 40.

#### 10. PARABÆNA.

This genus was proposed by me in 1851 for the *Cocculus sagittatus* and *C. oleraceus*, Wall. These were considered by Dr. Wallich as distinct species. They are climbing plants, natives of India and Ava, with oblong, extremely cordate or sagittate leaves, either entire or deeply and sinuously dentated. The genus agrees with *Anamirta* in having its anthers aggregated in a globular head, not sessile as in that genus, but borne on the apex of a long slender monadelphous column as in *Cissampelos*. It has 6 sepals, obsoletely saccate or swollen at base, as in *Jateorrhiza*, imbricated in 2 series, and 6 distinct petals. The sterile stamens of the female flower are arranged in an annular whorl round the stipitate gynæcium, on which 3 unilocular ovaries are seated. The putamen, as in *Rhigiocarya*, is covered with prominent, obtusely hooked, echinated spines, arranged in longitudinal series, the dorsal middle row terminating in a long apical tooth. The condyle is formed as in *Odontocarya* and *Aspidocarya*; but, for want of perfect specimens, the shape of the embryo is not known.

PARABÆNA, nob.—*Flores* dioici. *Masc.* *Sepala* 6, oblonga vel spathulato-oblonga, 2-seriata, imo carnosæ et subsaccatæ, 3 exteriora angustiora et paulo breviora, extus sericea, æstivatione imbricata. *Petala* 6, parva, spathulato-oblonga, extus dorso carinata, imo carnosæ, erecta. *Stamina* monadelphia: *filamenta* in columnam teretem gracilem centralem coalita; *antheræ* 6, subglobosæ, supra columnam 2-serialiter arcte aggregatæ, 4-sulcatæ, 4-locellatæ, rima transversali 2-valvatim hiantes.—*Fœm.* *Sepala* et *petala* ut in masc. *Stamina* sterilia

6, gynæcium ambientia, summo glanduloso-quadriloba. *Ovaria* 3, gynæcio brevi imposita, libera, erecta, gibba, glabra, 1-locularia, *ovulo* unico ad angulum internum medio appenso; *stylus* brevis, teres; *stigma* dilatato-recurvum, sulcatum. *Drupæ* 3, ovatæ, subcarnosæ, stigmatate persistente subexcentrico apiculatæ: *putamen* osseum, suborbiculare, compressum, ventre subplanum, ad dorsum convexum, spinis obtusis hamatis in seriebus longitudinalibus exasperatum, serie centrali prominentiore, et hinc in dentem longum apiculatum; *condylus* medio faciei ventralis, ovatus, extus concavus, intra loculum convexus; *semen* loculo conforme, summo condyli affixum. Cætera ignota.

Frutices scandentes *Indiæ orientalis*; folia *oblonga aut ovata, apice repente attenuata, cordata, vel angulato-hastata, 5-9-nervia, integra aut sinuato-dentata*; panicula *axillaris, petiolo sublongior*.

1. *Parabæna sagittata*, nob., Mag. Nat. Hist. ser. 2. vii. 39; Hook. & Th. Fl. Ind. i. 131;—*Cissampelos sagittata*, Wall.;—*Cissampelos oleracea*, Wall.;—ramulis spiraliter striatis, cinereo-pubescentibus v. glabriusculis; foliis oblongis, sensim angustioribus, apice longiuscule lineari-acuminatis, imo profunde hastatis, lobis basalibus acutis vel obtusioribus, membranaceis, margine subintegris vel sinuato-dentatis, simibus eroso-denticulatis, 7-9-nerviis, venis transversis reticulatis, supra breviter pilosulis, subtus fulvo-glaucis et subpuberulis, petiolo reflexo limbo brevioribus; paniculis supra-axillaribus, laxè divaricatis.—In India orientali, v. s. in herb. Soc. Linn.; Ava (Wall. Cat. 4983, ♂ sub *Ciss. sagittatus*); Patagong (Wall. Cat. 4984 A); Gongachoorā (*id.* 4984 B, ♂ et ♀ sub *C. oleraceus*); in herb. Hook., Assam (Griffiths, 355, ♂; 74, ♀); Khasia (Hook. & Th.).

The authors of the 'Flora Indica' attribute the differences in the form of the leaves and the erosure of the margins to the effect of local growth; following their example, I have amalgamated into a single species the four varieties formerly indicated. In *C. sagittata*, Wall., the leaves are narrower, sinuately dentate, with erosely denticulated margins; in *C. oleracea* they are broader, the teeth more distant; in some of the Assam and Khasia specimens the leaves are nearly entire. The leaves are 5-7 inches long, 3-4 $\frac{3}{4}$  inches broad, on a petiole 3 lines long; the inflorescence is an elongated, lax, dichotomous panicle, covered with short erect hairs.

## 11. ASPIDOCARYA.

This genus, established by the authors of the 'Flora Indica,'

is one of much interest ; its stamens are monadelphous after the manner of *Cissampelos* ; the shape of its extremely flattened putamen, with pectinated margins, is a modification of that of *Calycocarpum*, and its condyle is nearly evanescent as in *Tinomisium* : the form of its embryo with divaricated cotyledons, imbedded in distinct cells of the albumen, places the genus among the *Heterocliniæ*.

ASPIDOCARYA, H. & Th.—*Flores* dioici. *Masc. Sepala* 12, in seriebus ternatim imbricata, 6 interiora obovata, concava, submembranacea, glabra, 3-nervia, 6 exteriora gradatim minora et angustiora, margine ciliata. *Petala* 6, æqualia, sepalis dimidio breviora, rotundata, breviter unguiculata, marginibus infra medium auriculatim inflexis, nervis 3 ad medium protensis et illinc arcuatim nexis. *Stamen* unicum centrale ; *filamentum* tenuiter columnare, sepalis æquilongum ; *antheræ* 6, bilobæ, ad oram connectivi peltato-disciformis connatæ, margine rima transversa dehiscentes.—*Fl. fœm. Sepala* et *petala* ut in masc. *Stamina* sterilia 6, clavata. *Ovaria* 3 ; *stigma* subcapitatum sec. cl. auct. *Drupæ* 3, oblongo-ovatæ, pulposæ : *putamen* subosseum, subovatum, lenticulari-compressum, utrinque paulo convexum, facie dorsali carina elevata apice basi que excurrente cristatum, utroque margine in aciem sinuato-pectinatam vel truncato-dentatam late expansum, 1-loculare ; *condylus* obsoletus, nisi in striam longitudinalem discessus ; *semen* loculo conforme, ovatum, valde compressum : *integumenta* tenuiter membranacea, facie ventrali linea obscura longitudinali et raphe notata, et hinc ad striam condyli adherentia : *embryo* intra *albumen* carnosum fere 2-laminare simplex inclusus ; *cotyledonibus* foliaceis, oblongis, acutis, valde divaricatis, in locellis sejunctis utrinque positis, *radicula* supera tereti multo longioribus.

*Frutex scandens Indiæ orientalis* ; folia ovato-oblonga, subcordata, acuta, et subito attenuata, submembranacea, 5-nervia, subglabra, in nervis pubescentia, longe et tenuiter petiolata ; panicula racemosa, supra-axillaris, folio subæqualis ; flores parvi, viridescentes.

1. *Aspidocarya uvifera*, H. & Th. Fl. Ind. i. 180 ;—ramulis teretibus, striatis, parce strigoso-puberulis ; foliis oblongo-ovatis, imo cordatis, ultra medium sensim angustioribus, apice repente et lineari-attenuatis, 5-nerviis, valde reticulatis, supra glabris, sed in nervis puberulis, subtus pallidioribus, in nervis prominulis et in venis transversis reticulatis pubescentibus, petiolo tenuiter elongato, limbo longiore, imo torto et vix incrassato ; panicula ♂ racemiformi, supra-axillari, tenuiter elongata, undique glabra, ramis brevibus, paucifloris,



floribus breviter pedicellatis; ♀ racemo paulo brevior, ramis 1-3-floris, divaricatis; drupis uviformibus, breviter stipitatis, edulibus.—Himalaya, *v. s. in herb. Hook.*, Sikhim (Hook. & Th.), alt. 5000 ped.

The branches are slender, less than a line in diameter, with internodes of 3 inches; the leaves are 5 inches long from base to apex, or  $4\frac{3}{4}$  from basal sinus to apex, and  $3\frac{1}{2}$  inches broad, on a slender petiole 4 inches long; the ♂ raceme is slender, 5-7 inches long; its branchlets, 3 lines long, bear one to three flowers, which in bud are 1 line in diam.; the fructiferous slender raceme is 4 inches long; its filamentous branches, 2-4 lines apart, are 2-4 lines long; the pedicels, 3 lines long, bear generally a single oval drupe  $\frac{3}{4}$  inch long; the putamen (very much compressed) is 6 lines long, 4 lines broad.

## 12. ODONTOCARYA.

This is the only South-American form, as *Calycocarpum* is the sole North-American genus, of the *Heteroclinieæ* hitherto known, all the other eleven genera of this tribe belonging to Asia or Africa. The plant on which this genus was established was found by me in the Organ Mountains as far back as 1828, and again in 1837, but only in fruit; this enabled me to ascertain its peculiar carpological structure—an investigation that afterwards led me into an examination of the whole family. In 1845 my son sent me, from nearly the same locality, an imperfect specimen of another plant, which, from the similar form of its leaves and petioles and the structure of its flowers, appeared like a male species, and accordingly, in my "Notes on Menispermaceæ," in 1851, I alluded to it under this belief; for its floral parts, though in quinary numbers, presented the usual biserial arrangement of alternate sepals, and ten stamens, the outer five being quite free, with the same number of fleshy scale-like petals at their base, while the five internal stamens were monadelphous for half their length. This so far appeared to correspond with *Cosciniium*, *Chasmanthera*, and *Pselium*, except in the number of its parts; but, as I had met with the number five in other genera, the whole structure seemed conformable with *Menispermaceæ*. It is true that I found an occasional flower which, with a similar arrangement, presented the addition of a single 1-celled, 1-ovular ovary in the centre; but I had observed a similar occurrence in *Anomospermum* and *Tiliacora*. A more careful examination of the stem of the plant afterwards convinced me that it was not Menispermaceous, but a species of *Jatropha*, with occasional hermaphrodite flowers.

The fact is worth recording, as it offers another coincidence in the resemblance of the male flowers of some *Euphorbiaceæ* to those of *Menispermaceæ*, as St. Hilaire long before pointed out in the case of some species of *Phyllanthus*. The authors of the 'Flora Indica' (p. 171) have made some valuable observations, showing several points of resemblance in the floral structure of these two families; and the case above cited affords a strong proof of the truth of their remarks. The authors of the new 'Genera Plantarum,' in excluding *Odontocarya* from the order, and referring it to *Euphorbiaceæ*, probably had the circumstance above mentioned in their recollection; but they forgot at the same time that the genus maintains its ground upon the unquestionable organization of its seed, upon the habit of the plant, and upon the structure of its wood. The chief peculiarity of the genus consists in its putamen, which has a scutiform condyle as in *Calycocarpum*, *Aspidocarya*, *Jateorhiza*, *Parabæna*, and *Rhigiocarya*, and it is covered with a matted, short, papillose coating, imbedded in the fleshy pulp of its mesocarp, as in *Jateorhiza*, *Burasaia*, and *Hæmatocarpus*. Most of the species resemble *Tinospora* in their habit and in their cordate, glabrous, membranaceous leaves upon long petioles; the inflorescence is in slender racemes, longer than the petiole; the fructiferous racemes are somewhat longer, and, in the typical species, bear drupes of the size and colour of grapes, enclosing an osseous putamen, with three teeth at each extremity (whence the generic name); in the structure of its seed it corresponds with the rest of the *Heterocliniæ*. Belonging to this genus there is a group of plants which I formerly referred to *Chondodendron*, R. & P. (Ann. Nat. Hist. ser. 2. vii. 44), in consequence of their resemblance to Pöppig's drawing of his *Chondodendron convolvulaceum*; but when I met with the typical species of that genus, collected by Pavon, I saw at once the error. Subsequently I was able to identify the group alluded to with *Odontocarya*, from specimens in flower and fruit from Panama: these are all slenderer plants, with smaller leaves than those of my typical species; but they all possess the same habit and a similar floral and seminal structure.

ODONTOCARYA, nob.—*Flores* dioici. *Masc. Sepala* 9, quorum 3 exteriora dimidio minora, angustiora, et bracteiformia, 6 interiora majora, 2-serialia, æqualia, cuneato-oblonga, tenuiter membranacea, nervosa, æstivatione valde imbricata. *Petala* 6, subæqualia, sepalis opposita et iis paulo minora, ovata, tenuiter membranacea. *Stamina* 6, petalis opposita, iis æquilonga, imo in columnam brevem coalita, superne libera; *filamenta* latiuscula, complanata, tenuiter membranacea, apice rotundata,

antheras sæpe excedentia; *antheræ* 2-lobæ, lobis oblongis, parallele sejunctis, filamento immersis, rima marginali dehiscentibus. *Ovaria* rudimentaria nulla.—*Fæm.* *Sepala et petala* ut in masc. *Stamina sterilia* 6, forma marium, sed multo minora, antheris effœtis glandulæformibus terminata, circa gynæcium stipitatum inserta. *Ovaria* 3, oblonga, extus gibbosa, apice tenuiora, glabra; *stylus* nullus; *stigma* sessile, deltoideo-acutum, subito deflexum, radiato-incisum; *ovulum* unicum, ex angulo ventrali appensum. *Drupæ* ovatæ, 3, vel abortu solitariae, mucilagineo-carnosæ: *putamen* osseum, ovatum, subcompressum, dorso convexum, tuberculis serialibus scabridis rugulosum, apice imoque 3-dentatum, extus pilis papillosis creberrimis tectum, 1-loculare, intus læve, nisi ad ventrem lineis paucis transversalibus prominentibus notatum; *condylus* ad faciem ventralem, scutiformis, extus concavus, intra loculum convexus. *Semen* loculo conforme, meniscoideum, e summo condyli funiculo brevissimo appensum; *integumenta* tenuissima, facie ventrali *raphe* longitudinali signata: *embryo* fere rectus, intra albumen copiosum carnosum fere 2-lamellosum latere dorsali tenue, ventrali crassum, fissuris paucis transversalibus ruminatum, *radicula* supera, tereti, ad stylum spectante, *cotyledonibus* ellipticis, membranaceo-foliosis, 5-nerviis, lateraliter valde divaricatis, et in locellis sejunctis utrinque positis. Frutices scandentes, ramis *lignosis, verrucosis, cortice tenui, resiliente, ramulis teneribus, subfistulosis*; folia *alterna, longe petiolata, sæpius palata, ovata, cordata, acuminata, submembranacea, glabra aut subpubescentia, 5-7-nervia*; racemi *graciles, axillares, pedicellis subfasciculatis, 1-floris*; drupæ *pulposæ, uviformes*.

1. *Odontocarya acuparata*, nob.;—caule scandente, tereti, striato, ligno laxo fibroso, cortice resiliente tuberculis majusculis verrucoso; ramulis junioribus subfistulosis, lenticellatis; foliis ovatis, imo cordatis, sinu lato, mox acutioribus, apice repente attenuatis, acumine longe lineari, emarginato et mucronato, utrinque glaberrimis, supra lurido-viridibus, opacis, subtus glauco-pallidioribus, creberrime pellucido-punctulatis, imo 5-nerviis, nervis tenuibus rubescentibus venisque reticulatis, subtus prominulis, margine pellucido; petiolo tenui, striato, limbo æquilongo, vel dimidio longiore, glabro, laxo, imo incrassato et torto; racemo fructifero simplici, supra-axillari, petiolo paulo longiore; drupis uviformibus.—In Brasilia, v. v. in montibus Organensibus.

I found this plant climbing on trees on the outskirts of the virgin forests. Its branches are about  $\frac{1}{2}$  inch in diam., covered by a thin, membranaceous, striated and tuberculated bark, which

peels off easily; the branchlets are of a lax, fibrous texture, and almost fistulose; the internodes are  $1-1\frac{3}{4}$  inch, the petioles (3-4 inches long) being articulated at their origin upon a cupular swelling; the leaves are 2-4 inches long,  $2-3\frac{1}{2}$  inches broad, broadly cordate at the base, and suddenly attenuated upon the petiole, the summit narrowed by a linear attenuation 6 lines long,  $1\frac{1}{2}$  line broad. The fructiferous raceme is about 5 inches long, with slender simple pedicels, 2-4 lines apart and 6 lines long, each bearing from one to three drupes, of a darkish colour, of the size of grapes; the putamen, usually clothed with papillose fibres imbedded in the soft pulp, is 5-6 lines long,  $3\frac{1}{2}$  lines broad. The embryo has a superior radicle, 1 line long; its two acute divaricated cotyledons, imbedded in distinct cells of the albumen, being each 3 lines long, 1 line broad.

2. *Odontocarya macrostachya*, nob.;—*Cissampelos vitis*, *Vell. Fl. Flum.* x. tab. 137;—ramulis teretibus, tuberculatis; foliis late ovatis, cordatis, apice breviter acutis, petiolo crassiusculo imo torto subæquilongis; racemo fructifero petiolo 4-plo longiore, pedicellis longiusculis; drupis glabris, uvi magnitudine.—In Brasilia.

This is evidently allied to the preceding species, and known only from the figure above cited: its leaves are more oval, somewhat acute (not acuminated); they are  $4-4\frac{1}{2}$  inches long,  $3\frac{1}{2}-4$  inches broad, on a petiole  $4-4\frac{1}{2}$  inches long; the fructiferous raceme is 14 inches long, its pedicels 4-6 lines apart and 4-6 lines long.

3. *Odontocarya convolvulacea*, nob.;—*Chondodendron convolvulaceum*, *Pöpp. Nov. Gen.* ii. 65, tab. 190;—*Chondodendron tomentosum*, *Benth. (non R. & P.) Journ. Proc. Linn. Soc.* v. 2nd Suppl. 47;—ramulis fistulosis, striatis, compresso-teretibus, pubescentibus, cortice purpurascente, amarissimo; foliis ovatis, sensim acuminatis, imo profunde cordatis, lobis basalibus rotundatis, sinu angusto, utrinque villosis, subtus imprimis mollissimis, margine integro ciliatis, imo 5-nerviis; petiolo longissimo, gracili, puberulo, imo torto; racemis ♀ simplicibus, axillaribus, petiolo brevioribus; floribus majusculis, petalis quam sepalis 3-plo brevioribus; baccis uviformibus, pulposis, atro-violaceis, putamine ovali, compresso, marginem versus radiatim striato.—In Peruvia ad Cuchero.

This plant, figured by Pöppig, resembles the two preceding species in its soft, scarcely ligneous branchlets, and in the size and form of its leaves upon long slender petioles; but it differs in the pubescence of its leaves, in which respect it approaches

most of the following species, indicated by me many years ago. Mr. Bentham, in his 'Notes on *Menispermaceæ*,' above cited, confounded these five species into one, and in too hasty a manner fused them all into the *Chondodendrum tomentosum* of the 'Flora Peruviana,' a totally distinct plant. Pöppig describes this species as climbing to the height of 20 feet, its branches being fistulose, with internodes of  $2\frac{1}{2}$  inches; its leaves, apparently of thin texture, are  $4\frac{3}{4}$  inches long (with a basal sinus  $\frac{3}{4}$  inch deep),  $3\frac{1}{2}$  inches broad, on a slender petiole 6 inches long. The ♀ raceme is  $4\frac{1}{2}$  inches long, the sepals 3 lines long, acute, they and the scale-like petals being of a chestnut colour; the ovaries are gibbous, with a nearly sessile refracted stigma, which is acuminately deltoid, convex, and longitudinally carinated. The drupe is oval, 8 lines long, of a blackish-purple colour, copiously succulent, containing a putamen which is orbicular, compressed, with a radiately striated margin. He describes it as being 2 lines broad; but it is figured as  $4\frac{1}{2}$  lines long,  $3\frac{1}{2}$  lines broad: he omits all mention of the seed, though he states that the embryo is peripheric, the meaning of which it is impossible to conjecture; but, as he gives no figure, I conclude that these words have been inserted by mistake.

4. *Odontocarya tamoides*, nob.;—*Cocculus tamoides*, DC. *Syst.* i. 521, *Prodr.* i. 97;—ramulis scandentibus, teretibus, cortice resiliente, tuberculis sparse verrucosis; foliis orbiculari-ovatis, late cordatis, obtusis, mucronulatis, subcoriaceis, utrinque glaberrimis, imo 5-nerviis, margine translucente, valde reticulatis, nervis tenuibus venisque subtus prominulis, sub lente minutissime pellucido-punctulatis; petiolo brevi, striato, apice basi que articulato, et paulo incrassato; racemis solitariis, axillaribus, filiformibus, omnino glaberrimis; floribus minimis, breviter pedicellatis, subfasciculatis, axillis 1-bracteatis.—Prov. Rio de Janeiro, v. v. in sinu *Jurujuba*.

As this plant agrees so well with the characters assigned by DeCandolle to his *Cocculus tamoides*, I have considered them as identical, although the typical plant (perhaps erroneously) is stated to be from Cayenne. The leaves are nearly of an oval shape, somewhat pallid, and of a firmer texture than any of the other species: they are  $1\frac{1}{2}$ – $2\frac{1}{2}$  inches long,  $1\frac{1}{4}$ – $1\frac{7}{8}$  inch broad, on a petiole  $\frac{3}{4}$  inch long. The simple ♂ raceme is about  $2\frac{1}{2}$  inches long, with two to three pedicels fasciculated at alternate intervals of 1 or 2 lines, where there is a minute subulate glabrous bract; the minute flowers have six oval membranaceous sepals, six ovate petals one-fourth their length, six stamens nearly as long as the petals, with short, broad, membranaceous filaments united at base, the distinct anther-cells being imbedded in the filament:

these flowers are only in bud. St. Hilaire (Fl. Bras. i. 58) refers this species to *Cissampelos*; but he has confounded *Cocculus tamoides*, DC., with *Cissampelos tamoides*, DC.

5. *Odontocarya sagittata*, nob.; ramulis gracilibus, scandentibus, glabris, teretibus, striatis; foliis sagittato-oblongis, cordatis, sinu profundo et angusto, hinc gradatim angustioribus, apice repente attenuatis, acumine obtuso aut acuto, mucronato, marginibus subsinuatis, utrinque glabris, opacis, e basi 5-nerviis, valde reticulatis; petiolo gracili, imo incrassato, limbo dimidio brevioribus; racemo axillari, gracili, folium vix excedente, vel paulo brevioribus, pedicellis 1-floris, alternis, brevibus; floribus parvis.—In Demerara, *v. s. in herb. Hook.* (Mrs. Parker).

This species is intermediate with the preceding and following; its branches are very slender, with internodes of 2–2½ inches; the leaves are 3½ inches long from the bottom of the basal lobes, or 2¾ inches from the insertion of the petiole, 2½ inches broad across the basal lobes, thence becoming gradually narrower; the petiole is slender, 1¼ inch long; the racemes 3½ inches long; the three outer sepals are small and oval, the three inner ones double their length, spatulate-oblong, very membranaceous; six petals, two-thirds their length, fleshy, with the sides somewhat inflected; six stamens, as long as the inner sepals, the filaments being monadelphous at base for half their length, with distinct anther-cells fixed on the margins of the filaments.

6. *Odontocarya hederæfolia*, nob.;—*Chondodendron hederæfolium*, nob. olim;—*Chondodendron tomentosum* (*in parte*), *Benth.* (*non R. & P.*) *Proc. Linn. Soc. v. 2nd Suppl.* 47;—ramulis striatis, subpubescentibus vel glabris; foliis subrotundatis vel subhastato-trilobis, imo late cordatis aut truncatis, vel circa petiolum paulo decurrentibus hinc 2-sinuatis, sursum angustioribus, ad apicem 3-angularem acutis, e basi 5–7-nerviis, supra glabris, vel sparse pubescentibus, subtus pallidis, molliter cano pubescentibus, petiolo tenui pubescente æquilongis; racemo ♂ gracili, folio longiore; pedicellis 5–6, fasciculatis, fasciculis alternis: ♀ simillimo, pedicellis solitariis alternis; drupis minoribus.—In America meridionali intertropica, *v. s. in herb. Hook.*; Piauhy, ♂ (Gardner, 2009); Guiana (Parker); Rio Guainia, Rio Casiquiare (Spruce, 3567); Panama, ♂ et ♀ (Hall, 201).

This species is variable in the form of its leaves: it was found growing on old walls in Panama by Hall. In the Guiana plant (*var. canescens*) the leaves are more densely pubescent. It is a weak and slender plant, with leaves 2½–3 inches long, and about the same breadth, on a petiole 1½–2½ inches long; the ♂ raceme

is very slender, 2-5½ inches long, the pedicels 1 line long, the sepals 1 line long; the fructiferous raceme is 4-5 inches long, on a very slender rachis; the pedicels divaricated, 5 lines long; the putamen, compressed, 4½ lines long, 2½ lines broad, is denticulated at both extremities, as in the typical species, deeply hollow on the ventral face, and radiately striated on the margin, as Pöppig describes his species. The structure of the seed is quite similar to that already detailed.

7. *Odontocarya scabra*, nob.;—*Chondodendron scabrum*, nob. *olim*;—*Chondodendron tomentosum*, Benth. (*non R. & P.*) *l.c.* 47;—ramulis striatis, subpubescentibus; foliis rotundato-ovatis, profunde cordatis, apice attenuatis et subcanaliculatis, e basi 7-nerviis, supra scabridis, subtus præsertim in nervis albescentibus venisque rigido-pilosulis; petiolo tenui, striato, villosulo, limbo dimidio brevior. —In Brasilia, *v. s. in herb.* Hook., Prov. Piahy, Lago de Paranaguá (Gardner, 2473).

This species was found by Gardner growing among bushes. The leaves, though somewhat polished and deep green above, are covered with numerous minute tubercular hairs, scabrid to the touch; they are 2 inches long from the summit to the point of insertion of the petiole, beyond which the basal lobes extend 1¼ inch, thus making the leaves altogether 3¼ inches long and 3 inches broad, the petiole being about 1½ inch long. The specimen is without flower or fruit.

8. *Odontocarya filipendula*;—*Cocculus filipendula*, Mart. *Fl.* xxiv. *Beibl.* ii. 43; *Walp. Rep.* ii. 748;—radice incrassata, nigro-fusca, interdum filipendula, cylindrica, annulata, clavata, rarius subglobosa, erecta; ramulis novellis cinereo villosulis; foliis late cordatis, acutiusculis, sinu baseos profundo, sub-7-nerviis, membranaceis, ciliatis, supra nitidis, subtus præsertim in nervis pubentibus; petiolo longo, cinereo villosulo.—In prov. Rio de Janeiro ad Cabo Frio.

The above characters, given by Von Martius, when thus transposed, render the diagnosis more intelligible: a plant, the root of which is sometimes parasitic and filipendulous, cannot be an erect shrub. The tuberos kind of root here described is like that known in the East Indian genus *Tinospora*, of which *Odontocarya* is the representative in the New World. The form and membranaceous texture of the leaves accord with no other Brazilian genus; and it seems nearly allied to the last-mentioned species.

### 13. RHIGIOCARYA.

Among the plants collected in the Niger Expedition by Mr.

Barter is one that presents much the habit of a *Chasmanthera*: the structure of its putamen is sufficiently remarkable to make it the type of a new genus. The plant has a climbing Cissoid habit, with large, cordate, oblong, membranaceous leaves, supported on a rather lengthened petiole. It has an axillary simple fructiferous raceme, longer than its elongated petiole, with a somewhat flexuose rachis, having alternate fructiferous pedicels; the drupes are oval, slightly gibbous, fleshy, about  $\frac{3}{4}$  inch long, containing an oval and somewhat compressed putamen, covered along its sides and over its dorsal face with crowded, erect, stoutish spines, truncated at their apex, and terminated by a short tuft of fibrous hairs; the ventral face is smooth, formed by a large convex raised condyle, of an oval shape, with a long linear foramen down the middle, opening into a large hollow chamber which protrudes far into the cell. The seed is oval, meniscoid, slightly hollow on its ventral side, showing a longitudinal raphe the length of the delicate integument which covers a simple albumen; the embryo, of the shape usual in the *Heteroclinia*, has its cotyledons imbedded in distinct cavities in the albumen. The whole plant is glabrous, but neither its male nor female flowers are known. In many of its characters it approaches *Aspidocarya*, *Parabæna*, *Odontocarya*, and *Jateorhiza*, but differs from all of them in having a very large 1-locellate chamber in the condyle of its putamen. Its name is derived from ῥίγτος, *horridus*, *καρῖα*, *nux*, in allusion to its hystericoid putamen.

**RHIGIOCARYA**, gen. nov.—Flores ♂ et ♀ ignoti. *Drupa* ovoidea, pulposa, uviformis; *putamen* ovoideum, compressum, osseotestaceum, 1-loculare, crista lamelliformi apiculata lateribus et dorso undique crebre echinata, spinis rectis apice truncatis, singulis fascicula pilorum terminatis; *condylus* faciem ventralem fere totam occupans, scutiformis, prominens, subconvexus, lævis, extus meatu lineari longulo perforatus, ample 1-cameratus, et intra loculum seminis valde intrusus: *semen* loculo conforme, meniscoideo-ovatum, facie ventrali concavum, extus convexum; *integumenta* tenuissima, *raphe* ventrali longitudinali notata; *embryo* paulo convexus, intra *albumen* carnosum simplex inclusus, *cotyledonibus* tenuiter foliaceis, lateraliter valde divaricatis, in locellis albuminis sejunctim positus, *radicula* tereti brevi supera ad stylum spectante ter longioribus. Suffrutex scandens *Africæ tropicæ occidentalis*, *glaberrimus*; folia magna, late oblonga, valde cordata, 5-nervia, submembranacea, petiolo elongato; racemi fructiferi supra-axillares, solitarii, glaberrimi, petiolo longiores, pedicellis simplicibus; drupæ uvi-formes, pulposæ.



*Rhigiocarya racemifera*, n. sp.;—glaberrima, ramulis teretibus, striatis, cortice resiliente; foliis amplis, late oblongis, profunde cordatis, sinu rotundato, e medio angustioribus et gradatim acutis, imo 5-nerviis, nervis teneribus, membranaceis, supra pallidis, subtus cano-glaucis, valde reticulatis; petiolo tereti, striato, nitido, fuscescente, limbo brevioribus; racemo simplici, supra-axillari, glabro, petiolo longiore, pedunculo flexuoso, compresso, pedicellis fructiferis, simplicibus; drupis uviformibus.—Ad fluv. Quorra, v. s. in *herb. Hook.* (Barter, n. 3325).

The branchlets, twistedly striated, are  $1\frac{1}{2}$  line in diam., somewhat thicker at the nodes, where the bark scales off; the leaves are  $6\frac{3}{4}$  inches long, or  $5\frac{1}{2}$  inches long from the sinus to the apex, and 5 inches broad, on a petiole  $3\frac{1}{2}$  inches long, which is tortuous at the base; the rachis of the raceme is  $4\frac{1}{2}$ –5 inches long, flexuose, black, polished, marked from near the base with alternate cicatrices of the fallen pedicels, 2–3 lines apart; pedicels 3 lines long; drupes 8 lines long, 6 lines in diam.; putamen (including spines  $1$ – $1\frac{1}{2}$  line long) 7 lines long, 5 lines broad; condyle roundly scutiform, very prominent, 4 lines long,  $2\frac{1}{2}$  lines broad.

#### 14. ANOMOSPERMUM.

The type of this genus is a scandent shrub which I found in the Organ Mountains in 1837; other species exist in Guiana and Northern Brazil. They have all oblong, stiff, glabrous, subcoriaceous leaves, sometimes reticulated, with rigid petioles articulated on the branch in a prominent cup. The inflorescence is in axillary racemes issuing from a hairy tuft a little above the petiole. The male raceme, in some species, is the length of, or longer than the leaf, its alternate branches bearing one to three flowers, or sometimes the inflorescence is reduced to a solitary pedicellated flower in each axil. The female raceme is much shorter and few-flowered. The flowers are of similar size in both sexes, measuring, when expanded, 2 or 3 lines in diameter: they consist of six fleshy sepals, alternate in two series, the outer three being much smaller and bracteiform; they have six petals, also biserial, smaller than the inner sepals, rounded, extremely fleshy, the edges folded inwards so that each thus embraces and almost conceals a stamen fixed on its claw; each filament bears two small anther-cells half imbedded in its substance. A single sterile ovary is sometimes seen in the centre of the male flower, being columnar, somewhat ventricose, and terminated by a fungiform stigma: this I found of usual occurrence in the typical species, but I have not met with it in the few flowers

examined of other species. In the female flowers, the petals are divaricated, less fleshy; and the six sterile shorter stamens stand erect and free round three gibbous ovaria, supported on a short gynæcium. In the typical species, the fruit is gibbously oval and somewhat compressed, about an inch long, having its stipitate enlargement near the middle of the ventral side, at some distance from the persistent stigma: it is covered by a coriaceous indehiscent husk, of a yellowish colour, that becomes dark in drying; between this and the putamen is a yellowish mesocarp, having the consistence of an arillus, and apparently formed of rounded masses aggregated together, corresponding in size to the large arcoles indicated by the grooved lines on the surface of the putamen: it dries into a horny substance insoluble in water or alcohol. In the Guiana species, the fruit is cylindrically oblong, with a laterally basal support, and with the remains of the stigma in its apex, the putamen being quite cylindrical, and the embryo straight. The peculiar structure of the putamen and seed has been already noticed in the diagnosis of the tribe *Anomospermeæ*: one of its chief peculiarities consists in the form of its condyle, which is a longitudinal thin osseous plate, projecting from the ventral face of the putamen to near the centre of the cell, and upon which the seed is folded and attached; several other short transverse plates project across the dorsal face of the cell, which penetrate into the sinuosities of the albumen, after the manner of many *Anonaceæ*; these, however, are only adventitious processes. The lamellarly ruminated structure of the albumen much resembles that of *Tiliacora*, and the embryo, either straight or uncinately curved, is equally elongated and slender; but the radicle is relatively much shorter, and the cotyledons are accumbent in the one, and incumbent in the other.

Mr. Bentham, in his 'Notes on *Menispermaceæ*,' in accordance with the system he has so extensively adopted, considers all the plants of this genus reducible to a single species. It is impossible to concur in this opinion, which is absolutely incompatible with the facts here registered.

ANOMOSPERMUM, nob. — Flores dioici vel rarius polygami.

*Masc. Sepala* 6, biseriata, quorum 3 exteriora minuta, bractei-formia, 3 interiora valde majora, alterna, orbiculata vel oblonga, concava, carnosae, petaloidea, glabra, æstivatione imbricata. *Petala* 6, æqualia, sub-biseriata, sepalis paulo breviora, suberecta, vel arcte congregata, interdum unguiculata, gibbosa, concava, carnosae, apice truncata, marginibus valde inflexis, hinc stamina amplectentia. *Stamina* 6, petalis æquilonga et opposita, cum his inserta; *filamenta* sigmoidea, car-

nosa, subcompressa, apice incrassata; *anthera* 2-lobæ, introrsæ, imo divaricatæ, semiimmersæ, utrinque rima laterali dehiscentes.—*Fl. hermaphr.* *Sepala, petala et stamina* marium: *ovarium* unicum, sterile, centrale, cylindricum, *stigmatibus* clavato coronatum.—*Fl. fœm.* *Sepala et petala* marium. *Stamina* 6, breviora, antheris minutis, effectis. *Ovaria* 3, libera, obovata, gibba, supra gynæcium pilosum insita, sepalis interioribus opposita, 1-locularia, *ovulo* unico parieti ventrali affixo. *Stylus* brevissimus, excentricus, crassiusculus. *Stigma* ligulatum, acutum, canaliculato-recurvum. *Drupæ* 3, vel abortu 1, majusculæ, oblongæ, vel gibboso-ovatae, plus minusve excentrice stipitatae; *pericarpium* nitens, crassum, coloratum, styli vestigio apice vel longe a basi notatum, indehiscens; *mesocarpium* mucilaginoso-pulposum, translucidum, e glandulis plurimis angulatis arcte cohærentibus confectum; *putamen* cylindrico-oblongum, vel reniformi-ovatum, subosseum: *condylus* internus, ad faciem ventralem, laminiformis, longitudinalis, fere ad centrum loculi protensus, hinc semi-septum mentiens. *Semen* loculo conforme condylo utrinque plicatum: *albumen* copiosum, loculum implens, carnosum, in fissuris numerosissimis undique profunde ruminatum, *integumentis* 2 tenuibus fissuras penetrantibus arcte cinctum; *embryo* elongatus, tenuissimus, teres, fere rectus, vel imo arcuatus, in centro albuminis situs, *cotyledonibus* tenuibus, *radicula* brevi tereti ad hilum spectanti æquilatis et multipliciter longioribus. Frutices *scandentes, Brasilienses et Guianenses, glabri*; folia *alterna, elliptica, subcoriacea, 3-nervia, valde reticulata, petiolata*; racemi *supra-axillares*.

1. *Anomospermum nitidum*, nob., Ann. Nat. Hist. ser. 2. vii. 39; —A. Schomburgkii, *Benth. in part. Proc. Linn. Soc. v. Suppl.* 48 (*non nob.*);—alte scandens, ramulis striatis, sparsim recurvo-pilosis; foliis ellipticis, canaliculatim recurvis, acumine brevissimo obtuso et mucronato, 3-nerviis et penninerviis, nervis tenuissimis, venis valde et creberrime reticulatis, subcoriaceis, utrinque glabris, supra nitentibus, subtus nervis vix prominulis, in areolis sub lente crebre fulvo-granulatis, costa petioloque puberulis; petiolo apice crassiore et hinc repente incurvo; racemis supra-axillaribus, paucifloris, puberulis, ♂ petiolo paulo longioribus, ♀ petiolo brevioribus; floribus glabris, sæpius polygamis; sepalis exterioribus margine ciliatis, interioribus orbiculatis glabris carnosulis; petalis cum staminibus coacervatis; drupis majusculis, ovatis, valde excentricis, stipitatis, putamine reniformi-ovato, albumine embryoneque basin versus uncinato-curvatis.—In Brasilia, v. v. ♂ et ♀ in montibus Organensibus.

The branches are slender and very twining: the leaves are  $2\frac{1}{2}$ –3 inches long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch broad, on a slender petiole  $1\frac{1}{2}$  line long; they are plicately channelled, and bent back towards the tip, which is recurved, with a mucronate point; when fresh, they are dark green, shining above, pale green below, becoming of a reddish hue when dried; they are marked on both sides by raised crowded reticulations, and five pairs of scarcely prominent nerves (including the basal pair), the margin being cartilaginous. The ♂ panicle has a slender rachis, 2 inches long, with three or four one-flowered pedicels, 4–6 lines long, bracteated at base and in the middle, and which are sometimes branched at the bract, and thus 2-flowered: the flowers in bud are  $1\frac{1}{2}$  line in diam., expanded 3 lines; both sepals and petals are of a greenish white in the living state, becoming dark red when dried. The ♀ flowers are solitary in each axil, on pedicels 6 lines long, growing to 10 lines in fruit. The drupe is transversely ovoid, with a shining surface, of a yellowish colour (becoming blackish brown when dried),  $1-1\frac{1}{4}$  inch long,  $\frac{3}{4}$  inch broad, and  $\frac{3}{8}$  inch thick: the sarcocarp is tough and coriaceous; the mesocarp, yellow and transparent, is composed of convex aggregated glands; the subreniform putamen is 9 lines long, 5 lines broad; the albumen, deeply cleft into numerous fissures, is of a hard waxy consistence, the embryo imbedded in its centre being 9 lines long, slender, uniform in thickness,  $\frac{1}{4}$  line in diam., the radicle at its upper extremity pointing to the style being only  $\frac{1}{2}$  line long; the cotyledons, uncinately curved at their base, point to the stipitate support of the fruit, which in this species is not very far removed from the style.

2. *Anomospermum ovatum*, nob.;—ramis teretibus, lenticellis longiusculis notatis; ramulis lævibus; foliis ovalibus, imo rotundatis, apice obtusis, mucronulatis, marginibus cartilagineis, glaberrimis, supra nitidis, valde reticulatis, utrinque concoloribus, e basi 3-nerviis, cum alteris lateralibus utrinque 2; petiolo limbo dimidio brevior, glabro, apice crassiore et geniculato; racemo fructifero, axillari, brevi; drupis minoribus, ovatis, transversim reniformibus; stylo laterali apiculatis; putamine embryoneque curvatis.—*Brasilia, v. s. in herb. Mus. Brit.* (Bowie & Cunningham).

This species differs from the preceding in its smaller and more oval leaves (of a more rufescent hue), and in their glabrous petioles; they are  $2\frac{1}{4}$  inches long,  $1\frac{1}{2}$  inch broad, on a petiole  $1\frac{1}{4}$  inch long, the rufescent midrib and petiole being quite glabrous. The drupes, which are not quite ripe, are of the same shape as in the typical species, though smaller and very different in shape from those of some of the following species.

3. *Anomospermum oblongatum*, nob. ;—ramis teretibus, substriatis; foliis oblongis, utrinque acutis, apice canaliculatim recurvis, acumine longiusculo, sublineari, obtuso, e nervo excurrente calloso, marginibus cartilagineis, subrevolutis, e basi 3-nerviis, cum alteris lateralibus utrinque 3-4, utrinque glaberrimis et creberrime reticulatis, supra subnitidis, subtus vix pallidioribus et opacioribus, in areolis sub lente minutissime albidopunctulatis, nervis vix prominulis; petiolo limbo 8-plo brevior, glaberrimo; racemis ♂ axillaribus; folio æquilongis vel brevioribus, glaberrimis; pedicellis brevibus, 1-floris.—Prov. Rio de Janeiro, v. s. in herb. Mus. Brit. (Bowie and Cunningham).

This species differs from the two preceding in the size and much more acuminate form of its leaves, and in its very short and glabrous petiole, and its longer inflorescence. The leaves are  $3\frac{1}{2}$ – $4\frac{1}{4}$  inches long.,  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch broad, on a petiole  $\frac{1}{2}$  inch long. The male raceme is from  $1\frac{1}{2}$ –4 inches long, the pedicels 2 lines.

4. *Anomospermum Schomburgkii*, nob. l. c. 39; Benth. Journ. Proc. Linn. Soc. v. 2 Suppl. 48;—scandens, ramulis teretibus, striatulis, glabris; foliis oblongis, imo obtusis, summum versus sensim angustioribus, apice obtusiusculo vix mucronulato, coriaceis, supra nitidis, utrinque glabris et creberrime reticulatis, infra in areolis glaucescentibus, imo tenuiter 3-nerviis; petiolo limbo 4-plo brevior, apice incrassato et geniculato, subpuberulo; floribus ♂ supra-axillaribus, majusculis, pedicellatis, solitariis, rarius binis, pedicellis brachiatis 3-floris, sæpius in racemis laxis multifloris, folio longioribus, rachi pedicellisque longiusculis, his medio 1-3-bracteolatis, puberulis; sepalis oblongis, patentibus, glabris, margine ciliatis; petalis carnosis, cum staminibus in globum centralem coacervatis; drupis ovato-oblongis, stylo apicali, putamine embryoneque rectis.—In Guiana Britannica, v. s. (Schomburgk, 833).

Mr. Benthams, in his observations above quoted, considers this to be identical with the typical species; but he is certainly mistaken in this conjecture: it differs in its more glabrous branches, in the size and shape of its leaves, its shorter and stouter petioles, in its inflorescence with larger flowers, its oblong sepals, and more aggregated petals; but it is still more at variance in the shape of its drupe, its cylindrical putamen and straight embryo. Its fruit I have not seen, but it is described by Mr. Benthams. The leaves are 3-4 inches long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch broad; they are acute and recurved, but scarcely attenuated at the apex; the petiole is  $\frac{3}{4}$  inch long, deflected at its summit. In the lower axils the inflorescence is a nearly simple lax raceme, 8 inches

long; but in the young lateral branches it is much shorter, and often reduced to a single pedicellated flower. The pedicels are 4–6 lines long, glabrous, with two alternate bracteoles in the middle, which are slightly pubescent; the flower, 2 lines in diam. in bud, expands to a breadth of 4 lines, the inner sepals 2 lines long,  $1\frac{1}{2}$  line broad, the outer three bracteiform sepals having ciliate margins; the very fleshy orbicular petals, with involuted margins, are closely aggregated into a central disciform mass, the summits of the stamens peeping out at intervals, just as in the flowers of some species of *Hippocratea*, where the stamens are imbedded in the cavities of a fleshy disk: there is no trace of any ovary in the centre, as in the typical species.

5. *Anomospermum lucidum*, nob.;—A. Schomburgkii, *Benth. in part. l. c.*;—ramulis vix striatis, glaberrimis, in vetustioribus lenticellis rimosis pallidis signatis; foliis elliptico-oblongis vel lanceolato-oblongis, utrinque acutis, vel rarius imo obtusioribus, apice longe attenuatis et mucronatis, valde coriaceis, nitidissimis, utrinque lucidis, basi obsolete 3-nerviis, nervis lateralibus evanidis, omnino eveniis, supra creberrime punctulatis, subtus obsolete areolato-punctatis, costa infra prominula, glabra, marginibus cartilagineis; petiolo glabro, apice crassiore, deflexo, limbo 8-plo brevior; racemis ♂ supra-axillariibus, semper simplicibus, folio fere 2-plo longioribus, vel in junioribus folio dimidio brevioribus, omnino glabris; pedicellis floribusque mediocribus; sepalis 9, quorum 6 exterioribus, bracteiformibus, margine ciliatis; floribus ♀ solitariis, longiuscule pedunculatis, pedunculo quam petiolo 2-plo longiore; drupa oblonga, stipite brevi crasso paulo excentrico suffulta; stylo apicali; putamine cylindrico; embryone tenuissimo, fere recto, stipitem versus arcuato; radícula supera, brevissima.—In Guiana et Brasilia, v. s. in *herb. Mus. Paris.*, Cayenne (Melinon, 115, in fructu); in *herb. Mus. Brit.*, Demerara (Anderson, in fructu); in *herb. meo*, prope Panurè Rio Uaüpes (Spruce, 2563 ♂ & ♀ et in fructu).

This species is readily distinguished from the former, with which it has been confounded by Mr. Benthams, by its entirely glabrous habit, its remarkably smooth, polished, veinless leaves, by the absence (especially beneath) of lateral nerves, the basal ones being almost obsolete, by their more lanceolate form, their longer and very attenuated apex, more acute base, and shorter petiole, their longer, entirely glabrous, and quite simple racemes of considerable length, and by their smaller and apparently paler flowers, with an additional series of bracteiform sepals. The leaves are 3–4 $\frac{1}{2}$  inches long, 1 $\frac{1}{2}$ –2 inches broad, on a petiole 4–6 lines long; their acuminate apex is  $\frac{1}{2}$  inch long, 2 lines

broad. The male racemes are 5 inches long, the simple pedicels 4–6 lines long; the flowers,  $1\frac{1}{2}$  line in diam. in bud, are 3 lines in diam. when expanded, the petals being aggregated in the form of a trigonous disk, as in the preceding species. The axillary solitary peduncle of the female flower is 8–9 lines long, the floral parts being somewhat smaller than in the other sex; the drupe is  $1\frac{3}{8}$  inch long; the putamen is cylindrical, straight, 15 lines long, 4 lines in diam., somewhat pointed towards the summit, almost smooth on the outer surface, marked inside with raised lines corresponding with the fissures of the ruminated albumen; the condyle is a thin vertical plate running along the ventral internal face of the cell, protruding nearly as far as the axis, and upon this the seed is folded and attached along its edge by the line of the raphe; the albumen is cleft nearly to its centre by numerous horizontal fissures, which, again, are divided vertically and irregularly; the embryo, lying in the axis, is nearly straight, terete,  $\frac{1}{4}$  line in diam., 13 lines long; the radicle, which is very short, points to the summit and the style; both of the thin integuments enter into the clefts of the albumen through their whole depth.

6. *Anomospermum Hostmanni*, nob.;—ramulis rubescentibus, striatulis; foliis ovatis, imo rotundatis, apice attenuatis, acumine obtusiusculo, glaberrimis, coriaceis, nitidis, imo 3-nerviis, cum nervis lateralibus utrinque 3 longe intra marginem arcuatim nexis, eveniis, margine flavo, cartilagineo; petiolo glabro, limbo 5-plo brevior; racemo simplici, supra-axillari, folio longiore, pedicellis 2–3 fasciculatis in axillis alternis, glaberrimis, breviusculis, 1-floris.—In Guiana, v. s. ♂ *in herb. Mus. Paris.*, *Mus. Brit. et Hook.*; Surinam (Hostmann et K  ppler, 1298): ♀ *in herb. Hook.*, Guiane Fran  aise (Sagot, 1058).

This is distinct from all the preceding species, remarkable for its smaller, oval, pale, veinless, polished leaves and its elongated racemes. Its leaves are  $2\frac{1}{2}$  inches long,  $1\frac{1}{2}$  inch broad, on a petiole  $\frac{1}{2}$  inch long. The ♂ raceme is 3–5 inches long; the pedicels 1–3 lines long, quite glabrous and bractless; the expanded flowers  $2\frac{1}{2}$  lines in diam. In the ♀, at a distance of 2 lines above each axil is a slender solitary 1-flowered pedicel, or towards the end of the branches two or three pedicels; but they are not fasciculated, they are superimposed at the interval of a line between each; they are 4–8 lines long, with a bract above the middle: the flower is of the size of that of the ♂, and contains three ovaries; the fructiferous pedicel is much thicker, 8 lines long, bearing an oblong glabrous drupe,  $1\frac{1}{4}$  inch long, 7 lines in diam., the mucronated remnant of the style being somewhat excentrically apical.

## 15. TILIACTORA.

This genus was first proposed by Colebrook, in 1819, for the *Menispermum polycarpon*, Roxb.; but, as he was unacquainted with its carpological features, the genus was not adopted by subsequent botanists. DeCandolle, in his 'Prodromus' (1824), did not recognize it; for he named the same plant *Cocculus acuminatus*: from that time it continued unnoticed until 1851 (Ann. Nat. Hist. ser. 2. vii. 36), when I first pointed out the identity of the two plants, and described the structure of the seed; and this at once established the validity of *Tiliactora*. This genus, peculiar to Asia, is represented in the New World by *Abuta*, *Batschia*, and *Anelasma*: all nearly correspond in their floral structure, and resemble one another in the remarkable development of the seed—features which entitle them to rank in a distinct tribe, the *Tiliacoreæ*. It is surprising that the authors of the 'Flora Indica' and of the 'Genera Plantarum' have refused to acknowledge the validity of this very natural group, and have placed these genera in the same tribe with *Cocculus*, thus mingling in confusion genera with a very ruminated albumen and a very slender embryo having incumbent cotyledons as much attenuated as their very slender radicle, with other genera having a simple albumen and an embryo with accumbent, broad, foliaceous cotyledons—characters perfectly irreconcilable in any arrangement that lays claim to consistency.

The flowers in this genus, though usually diœcious, are sometimes polygamous; they have nine or twelve sepals, in ternate series, the three internal ones being much larger, and valvate in æstivation; they have six minute petals appearing like nectarial scales, and six stamens placed opposite to them, all inserted together upon a short columnar receptacle, on which three punctiform rudimentary ovaries are placed. In the numerous specimens of *Tiliactora* that I have seen, I have not yet found a female flower; I have, however, met with two species in which they are polygamous: in one case there are six petals, only three stamens, and three ovaries of equal length, oblong, ventricose, 1-celled, with a single appended ovule, and terminated by a subulate style; in the other case the flower has six petals, six stamens, four minute gibbously oval ovaries in the centre, with an obsolete style, and these are 1-celled, with a regular ovule. Roxburgh, who is the only authority, states that the female flower has sepals and petals similar to those of the male; but he mentions no stamens: he adds that it has twelve ovaries in a single whorl, each terminated by a subulate style, thus agreeing with those I have described; of these twelve ovaries as many as eight or ten often come to perfection, but sometimes four, or even



fewer, are matured: they are all borne on the summit of a cylindrical gynæcium, which increases in length and thickness with age, and on its summit are seen the cicatrices of the abortive ovaries, while all those that have been fertilized are carried up, each on a separate elongated ligneous fork, which grows out of the gynæcium, the fruits as they ripen being articulated on them: these radiating carpophori are solid emanations from the gynæcium itself, and form no part of the ovarial increment. This is a very remarkable feature in *Tiliacora*, being analogous to a similar growth which I have described in *Anamirta* and *Sciadotania*. It is probable that in different species of *Tiliacora* the number of ovaries may vary; but hitherto we have no evidence on the subject. In the development of the ovary, the growth is almost entirely on the dorsal side, and is so extremely excentric that, at maturity, the styles all connive towards the centre, in close proximity to the basal points of attachment of the drupes, which radiate horizontally round the gynæcium. It is not necessary to repeat here the peculiar features connected with the development of the putamen and seed, as they have been sufficiently explained; it remains, therefore, only to give a more full diagnosis of the genus.

*TILIACORA*, Coleb.—*Flores* dioici vel interdum polygami. *Masc.* *Sepala* 9–12, in ordine ternario alternatim disposita; exteriora gradatim minora et bracteiformia; 3 interiora multo majora, obovata, subcarnosa, æstivatione valvata. *Petala* 6, minima, carnosula, cuneato-oblonga, subbiseriata. *Stamina* 6, subæqualia, petalis 3–4-plo longiora et opposita, libera; *filamenta* gracilia, apice incrassata; *antheræ* 2-lobæ, introrsæ, lobis oblongis, dorsaliter semi-immersis, apice contiguus, imo paulo divaricatis, rima obliqua longitudinaliter dehiscentibus. —*Fl. hermaphr.* *Sepala* et *petala* maris. *Stamina* 3, petalis alternis opposita, mole maris, pollinifera. *Ovaria* 3, gynæcio insita, erecta, oblonga, imo tenuiter stipitata, dorso ventricosa, 1-locularia, *ovulo* unico (an fertili?) ad faciem ventralem medio appenso. *Stylus* subulatus, tenuiter elongatus, apice uncinato-incurvatus. *Stigma* obsoletum.—*Fl. fœm.* (sec. Roxb. *sepala* et *petala* maris; *ovaria* 12, in unica serie gynophoro insita; *stylus* subulatus; *stigma* simplex). *Drupa* 3–6, vel usque ad 12, valde gibboso-obovata, compressæ, in summo *carpophororum* totidem e gynæcio cylindrico enatorum suffultæ et articulata, hoc modo radiatim horizontales, singulæ stylo persistente imo proximo notatæ; *putamen* oblongum, compressum, imo truncatum, hinc ultra medium utrinque sulcatum, coriaceum, 1-loculare, *condylo* interno septiformi transversali ultra medium protenso, siccitate 2-marsupiatum,

ntus læve, 1-spermum; *semen* loculo conforme, 2-crure; *integumenta* membranacea, tenuia, inter rimas albuminis plicata, et per *raphen* ad condylum affixa; *embryo* elongatus, teres, intra *albumen* copiosum undique transversim et anfractuose ruminatum hippocrepice inflexus, cotyledonibus subcompressis, incumbentibus, *radiculæ* tereti æquilatis et 3-plo longioribus, hac in locello superiore ad stylum spectante, illis in inferiore ad hilum tensis.

Frutices *scandentes Asiae intertropicæ et insularum*; folia *oblongo-ovata, glabra, 3-nervia, et sæpe triplinervia*; racemi *subpaniculati, axillares, solitarii vel gemini*.

1. *Tiliacora racemosa*, Coleb., Linn. Trans. xiii. 67;—*Tiliacora acuminata*, Hook. & Th. *Fl. Ind.* i. 187;—*Cocculus acuminatus*, DC. *Syst.* i. 527, *Prodr.* i. 99; *Deless. Icon.* i. tab. 95;—*C. radiatus*, DC. *Syst.* i. 527, *Prodr.* i. 99;—*Menispermum acuminatum*, Lam. *Dict.* iv. 101;—*M. radiatum*, Lam. *l. c.* 100;—*M. polycarpum*, Roxb. *Fl. Ind.* iii. 816;—*Valli-caniram*, Rheede, *Mal.* vii. 5, t. 3;—*Tilia-kora*, Beng.;—*scandens*, ramulis glabris, striatis, cinereis; foliis ovato-oblongis vel ovatis, acuminatis, imo bisinuato-obtusis, rarius subcordatis, marginibus sæpe repando-crenatis, imo 3-nerviis et mox triplinerviis, glaberrimis, supra nitidis, subtus pallidioribus, nervis venisque reticulatis prominulis; subtulo subtenui; paniculis ♂ axillaribus, racemosis, folio longioribus vel interdum multo brevioribus, puberulis, ramis apice 1–3-floris; floribus sessilibus, bracteolis subulatis; petalis 6, minimis, apice retusis; staminibus 6 vel 8; racemis ♀ brevioribus, simplicibus; ovariis 9–12; drupis 3–8, radiantibus, singulis carpophoris propriis suffultis.—In India orientali, *v. s. in herb. variis, præsertim in herb. Soc. Linn.* (Wall. Cat. 4958).

The specific name given by Colebrook at the time he established the genus upon this plant certainly claims the preference to that adopted by the authors of the 'Flora Indica.' I have followed their example in identifying with it the *Cocculus acuminatus* and *Cocculus radiatus* of DeCandolle, although I am not satisfied that they form one species: we may always distinguish the one from the other by the comparative length of the petiole and a peculiar external aspect which it is difficult to describe; but as the length of the petiole often varies somewhat in the same specimen, it is not easy to draw the line of distinction in words. The leaves vary in size and colour: those answering to *Cocculus acuminatus*, DC., are larger, of a lighter colour, often pallid, more acuminate at the apex, with a more entire margin, about 5 inches long, 3 inches broad, on a petiole 1–1½ inch long; in *Cocculus radiatus*, DC., they are generally of a darker green,

rather acute than acuminate at the apex, with the margin more crenulated; they seldom exceed 3-4 inches long,  $1\frac{1}{2}$ -2 inches broad, on a petiole 4-10 lines in length; in rare cases, the leaf is 7 inches long, on a petiole only  $\frac{1}{2}$  inch in length. The *Cocculus variegatus*, Wall., is perhaps a distinct species, remarkable for its much larger, oblong leaves, with very short petioles; they are 7-8 inches long,  $4\frac{1}{2}$ -5 inches broad, on a petiole 8-11 lines long. Better evidence is wanting to establish its claims.

2. *Tiliacora fraternaria*, nob.;—ramulis teretibus, striatis, glabris; foliis obovatis, imo rotundato-truncatis, gradatim angustioribus, acumine brevi, obtuso, e basi 5-nerviis, margine crenulato-undulatis, submembranaceis, glaberrimis, supra subnitentibus, reticulatis, subtus flavescenti-lucidis; petiolo subtenui, glabro; racemis axillaribus, simplicibus, solitariis vel geminis, puberulis, petiolo 2-plo longioribus; petalis 6, spathulato-oblongis, apice emarginatis; staminibus 3; ovariiis 3, incurvato-linearibus; stylo longiusculo, subulato.—In Ceylon, *v. s. in herb. Mus. Brit.* (Kaddukkodi) sub nomen "*Smilax Zeylonica*," Soc. Frat. Unit. no. 25, A.D. 1785.

This is a species very remarkable for its hermaphrodite flowers. Its internodes are  $\frac{3}{4}$  inch; the leaves are  $3\frac{1}{2}$  inches long,  $2\frac{1}{2}$  inch broad, on a petiole of 9 lines; the racemes,  $1\frac{3}{4}$ - $2\frac{1}{4}$  inches long, have bracteated pedicels  $1\frac{1}{2}$ - $2\frac{1}{2}$  lines long, each bearing one or two sessile flowers; three inner sepals  $1\frac{1}{2}$  line long, with valvate æstivation; six minute petals; only three stamens, slender, double the length of the petals, and fixed on their claws, alternate with the inner sepals; three ovaria, opposite the inner sepals, of sigmoid form, ventricose, acute at each extremity, 1-celled, with an ovule fixed on the ventral side; the anther-cells seem quite perfect and polliniferous.

3. *Tiliacora cuspidiformis*, nob.;—*T. acuminata*, Hook. & Th. (*in parte*), *Fl. Ind.* i. 187; *Thwaites, Enum.* i. 12;—ramulis striatis, glabris; foliis oblongis, imo subacutis aut obtuse rotundatis, apice longe attenuatis, acumine angusto, acutissimo, e basi 3-nerviis, vix triplinerviis, marginibus subundulatis nervo munitis, utrinque glabris, supra viridibus, nitidis, valde reticulatis, subtus pallidioribus; petiolo tenui, limbo 4-plo brevior; racemo ♂ supra-axillari, simplici, folio longiore; pedicellis longiusculis, apice 3-floris, imo bractea lanceolata fere æquilonga munitis; floribus sessilibus, petalis cuneato-oblongis, lateribus introflexis; racemo ♀ axillari, paucifloro, folio 3-4-plo brevior. —In Ceylon, *v. s. in herb. Hook. et Mus. Brit.* (Thwaites, 1056; Wight, no. 45 in parte).

This species is distinguished by its lanceiform and extremely

cuspidate leaves and very elongated racemes, with long cuspidated, petiolated bracts, and sepals with involute margins; its internodes are 1-2 inches; the leaves are  $3\frac{1}{2}$ -4 inches long,  $1\frac{1}{4}$ - $1\frac{1}{2}$  inch broad, the narrow acuminate apex being  $\frac{1}{2}$  inch in length, and the petiole 9-10 lines long. The ♂ raceme is  $4\frac{1}{2}$ -5 inches long; its pedicels,  $\frac{1}{2}$  inch apart, are 4 lines long, the lower ones having narrow petiolated and cuspidate bracts 3-4 lines long. The flowers differ from all the preceding in the much larger size of the petals; the two outer series of sepals are very acute,  $1\frac{1}{2}$ -1 line long; the inner series acutely ovate,  $1\frac{3}{4}$  line long; the six very cuneate fleshy petals, rounded at the apex, are 1 line long, the six stamens  $1\frac{1}{2}$  line long. The fructiferous raceme is  $1\frac{1}{2}$ -2 inches long; the pedicels 4 lines long; the main carpophorum 3 lines long, slender, with from five to seven radiating slender forks, each 2 lines long, and bearing a single drupe,—all having a different aspect from the typical species.

4. *Tiliacora abnormalis*, nob. ;—ramulis striatis, pruinosis; foliis ovatis, a basi sensim paulo angustioribus, apice obtuso, rotundiusculo vel emarginato, imo subcordatis vel truncatis, marginibus vix crenulatis et subrevolutis, submembranaceis, obscure viridibus, utrinque glaberrimis, e basi 5-nerviis et mox triplinerviis, supra subnitidis, crebre reticulatis, nervis tenuibus vix conspicuis, subtus pallidis, nervis paulo prominulis; petiolo tenni, limbo 7-plo brevior, glabro, vix tumido; paniculis axillaribus, racemiformibus, solitariis vel geminis, folio paulo brevioribus, puberulis; ramis alternis, imo bracteolatis, apice 1-3-floris; floribus sessilibus, basi 2-bracteolatis, polygamis; petalis 6; staminibus 6; ovaris 4, ovatis, stipitatis, apiculatis; stylo obsolete.—In India orientali, *v. s. in herb. Wallich. Soc. Linn.* (Russell, xxii. b).

The internodes are 3 inches; the leaves are  $4\frac{3}{4}$  inches long,  $3\frac{3}{8}$  inches broad, on a petiole 8 lines long; the raceme is 3-4 inches long, the primary branches are 3-4 lines long, each bearing generally three sessile flowers on its apex; the three outer sepals are acutely orbicular, pilose, the three inner sepals (double their length) are oblong, subacute, glabrous; the petals ( $\frac{1}{6}$  their length) are cuneately ovate, emarginated, fleshy, seated at the base of six fertile stamens, which are as long as the inner sepals; filaments equal, somewhat terete, erect, slightly incurved, seated round the gynæcium; anthers oblong, connivent in the centre; ovaries four, some of them sometimes abortive, gibbously oval, with a lateral acute apex, the length of the petals, seated upon a stipitated gynæcium, each with a slender stipitate support,  $\frac{1}{3}$  its length, one-celled, with an apparently perfect ovule attached on the ventral side below the summit.

## 16. ABUTA.

In 1851 I endeavoured to establish the characters of this previously obscure genus, which had been fused into *Cocculus*, when I referred to it several plants from Guiana and Brazil, which approximate in habit and general structure to Aublet's typical species, *Abuta rufescens*. The leaves are generally of large size, broad, often cordate at base, smooth above, and covered beneath with dense yellowish tomentum, with very prominent digitate nervures, externally branched, and with strong transverse veins. The inflorescence is in long, pubescent, axillary racemose panicles, and its drupaceous fruits, densely tomentose, contain an oblong coriaceous putamen, with a bimar-supiate cell, enclosing a single hippocrepiform seed, having an albumen ruminated by numerous fissures, and enclosing an embryo much resembling that of *Tiliacora*.

Prof. Grisebach endeavoured to show, in 1858 (Journ. Proc. Linn. Soc. iii. 108), that *Abuta*, *Batschia*, and *Anelasma* constitute a single genus (*Abuta*), of which he then gave a new generic character in order to embrace the whole; he there confirmed the facts I had stated showing their close relation to *Tiliacora*; but at the same time, following the example of the authors of the 'Flora Indica,' he referred both *Abuta* and *Tiliacora* to the tribe *Cocculææ* of those botanists. In doing this he quite forgot the very important difference between the two opposite conditions of a deeply ruminated and a simple albumen, which are respectively found in the two tribes thus confounded together, also the very different forms of their embryo, and more especially the distinction that, in the one case, the cotyledons are accumbent, in the other incumbent—circumstances which render the one group essentially incompatible with the other.

In 1861 Mr. Bentham published his "Notes on *Menispermaceæ*" (Journ. Proc. Linn. Soc. v. Suppl. p. 45), when he followed the example of Prof. Grisebach in amalgamating *Batschia* and *Anelasma* with *Abuta*, and in a sweeping manner annulled most of the species I had indicated, reducing each of the genera thus fused together to little better than the condition of a single species.

Messrs. Bentham and Hooker, in their 'Genera Plantarum,' regardless of the peculiar structure of the seeds, persist, as before stated, in placing *Tiliacora* and *Abuta* (including *Batschia* and *Anelasma*) in the same tribe, and in juxtaposition with *Cocculus*.

Finally, MM. Triana and Planchon agree with Dr. Grisebach in associating into one all the three genera in question.

The difficulty of reversing the decisions of these united authorities is necessarily great, but perhaps not insurmountable.

I will therefore venture, in a few words, to show the differences existing between *Abuta* and *Anelasma*. There exists among the individuals forming these groups a very different habit, a notably distinct appearance in their leaves, and a dissimilar character in their inflorescence—features so striking as to render it almost impossible, with a mere glance at the plants, to mistake one genus for the other. In *Abuta* the midrib of the leaves beneath, as well as the lateral ramifications, have externally strong, prominent, pinnate nervures, which are absent in *Anelasma*; the leaves are all densely tomentose beneath, with a few exceptions, where they become glabrous with age; but even in that case the distinction is maintained by the branches, petioles, and racemes, which are thickly tomentose, while in *Anelasma* the same parts are quite glabrous. In *Abuta* the inner sepals are externally sericeous, very fleshy, and valvate in æstivation; in *Anelasma* the corresponding sepals are glabrous, more membranaceous in texture, and (though slightly) are decidedly imbricated in æstivation. In *Abuta*, in the male flower, each stamen bears a 2-lobed anther, the lobes separated from one another by a deep longitudinal channel or by a broader interval, and attached by their entire length to a broad filament; each lobe opens laterally by a vertical or oblique fissure: in *Anelasma* each stamen bears only a single globular anther, apicifixed upon, and half immersed in, the summit of a broad fleshy filament, bursting across its apex by a transverse gaping fissure into two valves, antical and postical, and divided inside by a septum parallel to the valves, as is well shown in Pöppig's figure. In the female flower of *Anelasma*, the structure of the sterile stamens is different: the ovaries are quite glabrous, with a different stigma, while in *Abuta* and *Batschia* the ovaries are densely pilose; the drupes in the two latter cases are thickly tomentose, while in *Anelasma* they are quite glabrous. In the case of larger flowers, such differences as I have indicated would not fail to be recognized in their full importance; and there can be no justification for ignoring them, or considering them as too trivial, on account of diminutive size. Here assuredly there is sufficient evidence to show that *Anelasma* ought not to be confounded with *Abuta*; but other differences will be seen when we come to speak of *Anelasma*.

Until lately, I had maintained *Batschia* as an independent genus, distinguished from *Abuta* by its stamens, which are rigidly hispid, while the small globular cells of the anthers are separated by a much wider interval, and laterally imbedded in a very thick filament, sometimes so deeply as to be invisible from the front; and, furthermore, the species have glabrous leaves. As these characters sometimes run into one another, I

have now retained *Batschia* as a section of *Abuta*, distinguished by the characters just mentioned. In *Batschia*, although the leaves are glabrous and smaller, they accord with those of *Abuta* in their ramified nervation, in which respect *Anelasma* differs from the whole group. All the species of *Abuta* seem to be scandent plants, while those of *Batschia* appear to be erect shrubs. When these plants are better known, I think it very likely that *Batschia* will establish its right to rank as a distinct genus.

While this paper was in the printer's hands, I received from Dr. Eichler the 25th Number of the 'Ratisbon Flora' (July 1864), giving an abstract of his arrangement of American *Menispermeæ*, as prepared for Prof. von Martius's 'Flora Brasiliensis.' Dr. Eichler has there adopted the views of other botanists which I have just combated, in uniting *Anelasma* with *Abuta*: he divides this genus into four sections,—(1) *Butua* (or *Abuta* proper); (2) *Batschia*; (3) *Anelasma*; (4) *Corynostemon*, which is founded on the plant I have here described as *Abuta* (*Batschia*) *acutifolia* (Spruce, 2763), and which I placed in that section on account of its hairy stamens. I have shown that the stamens of this species differ in no respect from those of *Batschia racemosa* and *A. Seemanni*, except in the greater breadth of the filament in the three inner stamens: the section *Corynostemon* will therefore hardly be received as a valid one, as my analyses will show. In regard to the determination of the several species of *Abuta*, I regret to differ as much with Dr. Eichler as with those botanists whose example he has followed.

ABUTA, Barrère, Aublet.—*Flores* dioici. *Masc. Sepala* 9, in ordine ternario alterna, 6 exteriora bracteiformia, linearia, 3 interiora majora, deltoidea, acuta, concava, extus sericeo-tomentosa, æstivatione valvata, apice inflexa. *Petala* nulla. *Stamina* 6, libera, subbiseriata, subæqualia, andrœcio brevi insita, sepalis opposita; *filamenta* subcarnosa, suberecta, apice incrassata, inflexa et conniventia, glabra vel pilosa, 3 interiora latiora; *antheræ* 2-lobæ, lobis discretis, ovatis, subparallelis, ad filamentum utroque latere omnino adnatis, singulis rima marginali longitudinali dehiscentibus.—*Fœm. Sepala* 6, ut in mare. *Petala* nulla. *Stamina* sterilia 6, æqualia, *filamenta* filiformia, subincurva, ovarii æquilongia, glabra aut pilosa, interdum clavata et hinc apice glandulis 2 minutis signata, gynœcio villosissimo affixa. *Ovaria* 3, libera, sepalis interioribus opposita, dense sericea, 1-locularia; *ovulum* solitarium, subincurvum, supra medium faciei ventralis funiculo

brevi suspensum. *Stylus* brevissimus, teres, subexcentricus. *Stigma* carnosum, deltoideo-obliquum, in lobos 3 digitatos laciniatum. *Drupa* 3, vel abortu panciores, magnæ, siccæ, valde tomentosæ, horizontaliter oblongæ, breviter stipitatae, styli vestigio prope basin notatæ; *putamen* oblongum, subcompressum, utrinque ultra medium sulcatum, coriaceum, 1-loculare, *condylo* septiformi sulcis apposito e basi ultra medium loculi protenso, proinde 2-marsupiatum, monospermum; *semen* loculo conforme, bicrura; *albumen* copiosum, carnosum, fissuris numerosis anfractuosus irregularibus profunde ruminatum, *integumentis* laxis tenuissimis intra fissuras plicatis cinctum; *embryo* tenuis, teres, hippocrepice inflexus, centro albuminis immersus, *cotyledonibus* incumbentibus, *radicula* supera ad stylum spectante longioribus.

Frutices *Americæ intertropicæ volubiles*, ramulis *tomentosis*; folia *orbicularia vel ovata, subacuta, imo sæpe cordata, supra glabra, subtus tomentosa, 3-5-nervia, nervis extus ramosis et transversim crasse venosis, petiolo longiusculo, pubere*; racemi *paniculati, axillares, sæpissime longissimi, tomentosi*; flores *minuti, pilosi*.

§ 1. *Abuta vera*: *folia crasso-coriacea, subtus valde tomentosa, nervis extus ramosis, grossis, valde prominentibus; stamina in ♂ glabra; plantæ scandentes*.

1. *Abuta racemosa*, Aubl. (non DC. nec Tr. & Planch.), Pl. Guian. i. 618, t. 250;—ramis teretibus, sordide cinereo tomentosis; foliis amplissimis, ovatis, subcordatis, apice sensim acutis aut repente et brevissime acuminatis, mucronatis, imo 5-nerviis, nervis intermediis paulo divaricatis et extus ramosis, nervis lateralibus e costa utrinque 3 longe a basi enatis, marginibus nervo crasso limbatis, coriaceis, supra glabris, bullato-rugosis, in nervis venisque transversis striatis, nervis obsolete tomentos, imo juxta petiolum macula magna cinereo tomentosa signatis, subtus brunneo tomentos, nervis venisque transversis crassis valde prominentibus petioloque tomento brevissimo adpresso rufo-cinereo indutis; petiolo valido, apice incrassato; racemis fructiferis axillaribus; drupis ovalibus, valde tomentos. — In Guiana, *v. s. in herb. Mus. Brit.* (specim. typ. Aublet).

Aublet states that the larger leaves are 11 inches long and 9½ inches broad; in the above specimens the larger leaf is 10 inches long (including the basal sinus, ½ inch deep), 7¾ inches broad, on a petiole 3½ inches long; the smaller leaves are truncated at base, nearly orbicular, with a very short acuminated point, 5 inches long, 4¾ inches broad, on a petiole 3¾ inches long.



In a portion of the fructiferous raceme figured by Aublet there are three drupes seated together on a pedicel  $\frac{3}{4}$  inch long; they are 1 inch long,  $\frac{3}{4}$  inch diam. According to MM. Triana and Planchon, the plant described by DeCandolle as *Abuta rufescens* is very different from the type above described: it is a species which they have named *Abuta Candollei*. They also describe the following species, which they erroneously consider to be the same as Aublet's plant; but it will be seen to be very different, both in the pubescence and the nervation of the leaves. In Aublet's plant the intermediate basal nerve diverges from the midrib at a medium angle of  $30^\circ$ , and has four strong spreading external branches; only three pairs of lateral nerves spring from the midrib, the first of which emanates from it at a distance of  $3\frac{1}{2}$  inches from the base: this character is seen in the smaller as well as in the larger leaves, and is well shown in Aublet's drawing. The upper surface of the leaf is very flat, the nerves and transverse veins being finely striated, and there is a broad patch of cinereous tomentum round the basal confluence of the nerves; the under side is covered with a short brown tomentum; the very prominent nerves and the petiole are densely covered with an extremely short cinereous tomentum having a somewhat rufescent hue, in no way resembling the pubescence of the following species.

2. *Abuta barbata*, nob.;—*Abuta rufescens*, *Tr. & Pl. (non Aubl. nec DC.)*, *Ann. Sc. Nat.* 4 sér. xvii. p. 44;—ramulis validis, teretibus, pilis longis mollibus ferrugineis densissime barbatis; foliis magnis, lanceolato-oblongis vel ovatis, imo paulo cordatis, apice attenuato-acutis, mucronatis, e basi 5-nerviis, nervis intermediis valde divaricatis, extus ramosis, nervis lateralibus e costa utrinque 5–6 parallele divergentibus mox e basi enatis, nervo marginali limbatis, coriaceis, supra punctulatis, glabris, apud nervos immersos pubescentes venasque transversas profunde canaliculatis, subtus undique ferrugineo pilosis, nervis crassis venisque transversis valde prominentibus; petiolo longo pilis patentibus ferrugineis dense ac molliter lanato, valido, imoque apice incrassato: racemis ♀ axillaribus, solitariis, pubescentibus, folio dimidio brevioribus; pedicellis 1-floris, longiusculis, infra medium 2-bracteolatis; sepalis ovarisque cinereo pilosis; staminibus sterilibus 6, semiteretibus, infra medium longe ciliatis.—In Cayenne, *v. s. in herb. Hook.*; Karoung (Sagot, 919).

This species is considered by MM. Triana and Planchon to be the *Abuta rufescens* of Aublet, in which it will be seen they are mistaken; but they are correct in stating it to be different from DeCandolle's plant of that name. The branches are abundantly

covered with extremely dense soft hairs, at least 1 line long, in which respect it is notably at variance with the preceding species. In one of Sagot's specimens the leaves are  $8\frac{1}{2}$  inches long,  $7\frac{1}{4}$  inches broad, on a petiole  $4\frac{1}{2}$  inches long; in the other they are  $9\frac{3}{4}$  inches long, 5 inches broad, on a petiole  $3\frac{1}{2}$  inches long. The upper surface of the leaves is glabrous, and hollowed in broad channels along the lines of the nerves and transverse veins, which are clothed with reddish hairs; the intermediate basal nerves are widely divaricated at a medium angle of  $45^\circ$  with the midrib; five or six lateral nerves spring from the midrib, the first at a distance of only  $1\frac{1}{2}$  inch from the base; beneath, the leaves are ferrugineo-pilose (not tomentose), and the petiole is thickly covered with long, spreading, ferruginous hairs. The raceme is 7 inches long, and its numerous 1-flowered pedicels are 6–8 lines long.

3. *Abuta Candollei*, Tr. & Pl., Ann. Sc. Nat. 4 sér. xvii. 45;—*Abuta rufescens*, DC. (*non Aubl.*) Syst. i. 542, Prodr. i. 103;—ramulis brunneo-griseis, subvelutinis; foliis late ovatis, subacutis, basi rotundatis vel subcuneatis et 5-nerviis, nervis extus ramosis, rigide coriaceis, supra opacis, reticulato-punctulatis, glabris, sed in nervis paulo elevatis, cinereo tomentosis, venis transversis immersis, subtus cinereo vel rufescente tomentosis, nervis venisque valde prominentibus; petiolo tereti, sæpe geniculato, paulo tumido, limbo dimidio brevioribus: paniculis ♂ axillaribus, solitariis vel geminis, folio brevioribus, cinereo velutinis; ramis alternis, imo bracteolatis, multifloris; floribus minimis, extus cinereo velutinis, intus atro-purpureis: racemis ♀ paucifloris, folio brevioribus; drupis ovatis, subcompressis, divergentibus, griseo velutinis.—In Cayenne, *v. s. in herb. Hook.*; Guyane Française (Sagot, 1264).

The above diagnosis is formed upon an examination of a flowerless specimen named by M. Triana himself: it is certainly distinct from Aublet's plant, and is stated by him and Dr. Planchon to be identical with that from which DeCandolle derived the character of his *Abuta rufescens*, a plant still preserved in the Paris herbarium. It is distinguished by its much smaller leaves, which are oval, not cordate, clothed with cinereous (not reddish) pubescence, by its flowers being covered with adpressed silky hairs. They also pronounce the two plants just mentioned to be identical with the original specimen of *Cocculus Martii*, St. Hil. & Tul., collected in Rio de Janeiro by Guillemain. The correctness of this identification may be questioned, not only on account of the great distance of their localities, but because, of the two plants collected there by Guillemain, one corresponds with my *Abuta heterophylla*, the other with my *A. macrophylla*,

both obtained by me in Rio de Janeiro. They likewise pronounce it to be identical with the *Cissampelos ovata* of the 'Flora Fluminensis,' x. t. 141, which appears to me very doubtful; while, on the other hand, MM. St. Hilaire and Tulasne declare their *Cocculus Martii* to be the same as the *Cissampelos tomentosa* of the same work, which agrees with my own observations. The *Cissampelos ovata*, Velloz, above mentioned appears to me to partake more of the characters of a *Chondodendron*: the flowers are larger than in any species of *Abuta* I have met with, the sepals being refracted as in the former genus, while the panicle is much shorter and more spreading than in *Abuta*; in habit and inflorescence it harmonizes with the several species of *Chondodendron* which I have described from near the same locality where Velloz's plants were collected. DeCandolle described his plant as having leaves 2-3 inches long, and drupes 1 inch long. In M. Sagot's specimen the leaves are  $4\frac{3}{4}$ -5 inches long,  $3\frac{1}{2}$ - $4\frac{1}{2}$  inches broad, on a strong petiole  $2-2\frac{3}{4}$  inches long.

4. *Abuta heterophylla*, nob.;—*Cissampelos convexa*, Vell. *Fl. Flum.* x. tab. 142;—*C. tomentosa*, Vell. *l. c.* tab. 143;—*Cocculus tomentosus*, *Mart. herb. Bras.* 285 (*non Coleb.*);—*C. Martii*, *St. Hil. & Tul. Ann. Sc. Nat.* xvii. 135;—ramis ramulisque tomentosis; foliis ovatis, imo subacutis, obtusis aut rotundatis, apice brevissime et repente acuminatis vel rotundatis et retusis, coriaceis, supra plus minusve convexis, lucidis, e basi 5-nerviis, cum 2 alteris mox evanidis, nervis superne impressis et tomentellis, subtus omnino cinereo vel ferrugineo tomentosis, nervis venisque transversis prominentibus; petiolo elongato, basi apiceque incrassato; paniculis racemosis ♂ 2-3, supra-axillaribus, pallide albido tomentosis, elongatis; racemis ♀ folio brevioribus; drupis gibboso-oblongis, dense tomentosis.—In Rio de Janeiro, *v. v.*, Morro Flamengo; *v. s.* in *herb. Soc. Linn.*, Brasilia (Bowie et Cunningham).

The leaves in this species vary very much in size and shape; but in all their different forms they have an aspect very different from the preceding; they are very convex, and never flat as in the typical plant; they are more coriaceous than in that and the following species; they have a shagreened surface above, owing to the minuteness of the prominent reticulations; the margins, very revolute and thickened by a prominent nervure, are quite smooth above, except in the channelled nerves and transverse veins, which are tomentose; they are densely tomentose beneath, and have very prominent strong nerves and an extremely short acute point at the rounded summit, which is sometimes wanting. There is a difference in the mode of nervation of the leaves in

this and the following species, similar to that which exists between the two first-mentioned plants: the primary pair of basal nerves diverge from the midrib at an angle of  $25^{\circ}$  to  $30^{\circ}$  only, while the lateral nerves spring from the midrib much beyond the moiety of its length; in *A. macrophylla* the nerves are more spreading. The leaves are  $3\frac{1}{2}$ –8 inches long, 3–6 inches broad, on a petiole 2–4 inches long. The raceme-like ♂ panicles, on a somewhat flexuous rachis, are 6–10 inches long, with lateral branches, generally binate, 4–6 lines long, bearing at the apex, middle, and base an almost sessile agglomerated head of minute tomentose flowers. The fructiferous raceme is about  $2\frac{1}{2}$  inches long, on a rather stout tomentose peduncle; the pedicels, 2–6 lines apart, are 3 lines long, stout, swollen at the apex, which bears three very tomentose ovately oblong drupes, expanded into a thick excentric stipitate support; they are  $1-1\frac{1}{2}$  inch long, somewhat compressed, 9 lines broad.

5. *Abuta macrophylla*, nob.;—*Cocculus macrophyllus*, *St. Hil. & Tul. Ann. Sc. Nat.* xvii. 134;—*Cissampelos Abutua*, *Vell. Fl. Flum.* x. tab. 140;—ramis teretibus, fulvo tomentosis; foliis amplissimis, orbiculari-ovatis, imo bisinuatis, non cordatis, apice breviter et repente attenuatis, longe cuspidatis, e basi 3-nerviis, nervis lateralibus iterum nervosis, supra glabris nisi in nervis impressis, subtus dense brunneo tomentosis, nervis venisque transversis et reticulatis prominentibus; petiolo velutino utraque extremitate tumidulo et geniculato; racemo ♀ axillari, folio brevior; drupis ovatis, majoribus, subglabris.—In Rio de Janeiro, *v. s. in herb. meo* (S<sup>a</sup> Theresa); in *herb. DeCand.*, Monte Corcovado (Guillemin, 639), sub nomine "*Cissampelos Pareira*."

This species differs from the preceding in its much flatter leaves (of a darker green colour) being less coriaceous, with thin and scarcely revolute margins; the transverse nervures are scarcely channelled; they are also distinguished by their long cuspidate point at the apex, and more slender petioles. My specimens quite correspond with Guillemin's: the primary pair of basal nerves diverge from the midrib at an angle of  $35^{\circ}$  to  $40^{\circ}$ , while the lateral nerves spring from the midrib below the moiety of its length, in which respect it differs from the preceding species, as before mentioned—a difference which is constant, whatever may be the size of the leaves. In my specimens the leaves are 8 inches long, 6 inches broad, on a petiole  $3\frac{1}{2}$  inches long; Guillemin's are 5–7 inches long,  $4\frac{1}{2}$ –6 inches broad, on a petiole of  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches. In Velloz's drawing they are  $9\frac{1}{2}$  inches long,  $8\frac{3}{4}$  inches broad, on a petiole of  $5\frac{1}{2}$  inches; but they are said to be sometimes 13– $14\frac{1}{2}$  inches long and 13 inches broad. The

fructiferous raceme in Velloz's drawing is 4 inches long, and the oval drupes are 1 inch long,  $\frac{3}{4}$  inch diam.

6. *Abuta oblonga*, nob.;—ramis striatis, ferrugineo tomentosis, demum subglabris; foliis ex axillis cupuloso-nodosis, oblongis, imo rotundatis, apice subito et breviter attenuatis, mucronatis, rigide coriaceis, e basi 5-nerviis, supra pallide viridibus, glabris, subnitidis, in nervis venisque transversis et reticulatis sulcatis, subtus cano vel flavido tomentosis, nervis venisque prominentibus; petiolo elongato (in ♀ brevior), ferrugineo tomentoso, imo apiceque incrassato: paniculis racemosis ♂ plurimis fasciculatis, supra-axillaribus, gracilibus, petiolo longioribus, tomentosis; floribus minutis: racemis ♀ solitariis, supra-axillaribus, paulo brevioribus; pedicellis medio imoque bracteolatis, 1-floris.—In Cayenne, v. s. in herb. Mus. Brit. ♂ et ♀ (Martin); in herb. Mus. Paris. ♀ (Le Blond).

This is a very distinct species: the leaves in the ♂ specimens are quite glabrous above; but in the ♀ the sulcated nervures are absolutely tomentose: all are very densely tomentose beneath; they are  $4\frac{1}{2}$ –6 inches long,  $2\frac{1}{4}$ – $3\frac{1}{4}$  inches broad, on a petiolo  $2\frac{1}{2}$  inches long. There are about four fasciculated panicular racemes in each axil, 4–5 inches long; the ♀ racemes 3–4 inches long, all clothed with greyish tomentum.

7. *Abuta cuspidata*, nob.;—*Abuta rufescens*, Benth. (non Aubl.) Journ. Proc. Linn. Soc. v. Suppl. 49;—ramulis teretibus, substriatis, pruinoso tomentellis; foliis ellipticis, utrinque acutis, apice cuspidato-mucronatis, e basi 3–5-nerviis, nervis intermediis extus nervosis, marginibus crenato-sinuosis, supra glaberrimis et obsolete rugulosis in nervis profunde sulcatis, subtus sordide cinereo vel brunneo tomentosis, nervis venisque transversis reticulatis prominentibus; petiolo pruinoso, repente deflexo, imo summoque incrassato et torto, in ♀ recto et vix incrassato: paniculis racemosis ♂ 3–4 fasciculatis, supra-axillaribus, tomentosis, incurvis, folio subæquilongis; ramis brevissimis, alternis, apice flores 3–4 parvos glomeratos gerentibus: racemis ♀ 2–3 fasciculatis, folium æquantibus; pedicellis alternis, 1-floris; drupis oblongis, tomentosis.—In prov. Para Brasiliæ, v. s. ♂, Barra do Rio Negro (Spruce).

Internodes  $\frac{3}{4}$ – $1\frac{1}{4}$  inch; leaves 4–5 inches long,  $2\frac{1}{2}$ –3 inches broad; petiolo 1– $2\frac{1}{2}$  inches long; panicular raceme 5– $7\frac{1}{2}$  inches long; branches 1 line long, bracteated at base, bearing three flowers, bracteated at their base, on the apex, when in bud  $\frac{1}{2}$  line in diam.

Var. *ovalifolia*, nob.;—*Abuta Grisebachii*, Tr. & Pl. Ann. Sc. Nat.

4 sér. xvii. 47 ;—foliis paulo latioribus, supra in nervis sulcatis tomentellis, apice mucronatis non cuspidatis.—*v. s.* ♂ et ♀ San Gabriel, Rio Negro (Spruce, 2340).

Internodes 1–3 inches ; leaves  $3\frac{1}{4}$ – $3\frac{3}{4}$  inches long, 2– $2\frac{1}{2}$  inches broad ; petiole 14–18 lines in diam. ; racemes ♀ 3–4 inches long ; pedicels 1 line ; flower, in bud,  $\frac{1}{2}$  line in diam. ; incrassated pedicels, in fruit, 2 lines long ; drupes not quite matured, 9 lines long, 5 lines broad, compressed.

8. *Abuta rigida*, nob. ;—ramulis teretibus, fusco-tomentosis ; foliis oblongis, imo rotundatis, apice acutis et cuspidato-mucronatis, rigide coriaceis, fuscis, utrinque glaberrimis, supra nitentibus, subtus opacioribus, e basi 3-nerviis, cum nervo altero in margine mox evanido, supra in nervis sulcatis, subtus nervis venisque transversis immersis vix prominulis ; petiolo subtomentoso, imo apiceque incrassato, limbi quarta vel quinta parte longitudinis ; paniculis racemosis, 2–3, fasciculatis, supra-axillaribus, dense griseo tomentosis, petiolo 2–3-plo longioribus ; ramis brevibus ; floribus minutis, brevissime pedicellatis ; pedicellis imo bracteolatis.—In prov. Para Brasilæ, *v. s.*, Barra do Rio Negro (Spruce).

The entire glabrous leaves and their semi-immersed nerves give to the plant much the appearance of an *Anelasma* ; but the tomentose stems and petioles, the pubescent and stouter racemes, indicate, without further examination, that it is a species of *Abuta* ; and this is proved by the structure of the flowers. The branches are  $1\frac{1}{2}$  line in diam., the internodes  $1\frac{1}{2}$ –3 inches ; the leaves  $4\frac{1}{2}$ – $6\frac{1}{4}$  inches long,  $2\frac{1}{4}$ – $3\frac{1}{2}$  inches broad ; the petiole  $\frac{3}{4}$ – $1\frac{1}{2}$  inch long, the panicular racemes  $1\frac{1}{2}$ –3 inches long, the branches  $1\frac{1}{2}$  line long, the pedicels  $\frac{1}{2}$  line long, the flower in bud  $\frac{1}{4}$  line in diam.

*Species presumed, but unknown to me.*

9. *Abuta? oblongifolia* ;—*Cocculus oblongifolius*, *Mart.* (*non DC.*) *Flor.* xxiv. *Beibl.* ii. 43 ; *Walp. Rep.* ii. 748 ;—subvolubilis, ramis, petiolis floribusque dense aureo vel fulvo tomentosis ; foliis coriaceis, oblongo-ellipticis, basi cordato-rotundatis, apice brevi acutiusculo, obscure 3–5-nerviis, junioribus subtus (præsertim in nervo) fulvo tomentellis ; racemis ♀ brevibus, simplicibus ; drupis lineari-ellipticis, 8–9 lin. longis.—In Rio de Janeiro.

From its general character, and more especially the size and shape of its fruit, there can be little doubt that this plant is a species of *Abuta*, certainly not a *Cocculus*. It approaches the last species in its semi-immersed nervures.

10. *Abuta? Imene*;—Cocculus Imene, *Mart. Fl.* xxiv., *Beibl.* ii. 44; *Walp. Rep.* ii. 748;—caudice subvolubili, sæpe compresso; ramulis subscandentibus, cinereo pubescentibus v. tomentellis; foliis coriaceis, late ovatis, acuminatis, basi acutis, supra nitidis, quintuplinervis, nervis lateralibus evanidis; petiolis nervisque foliorum novellorum et inflorescentia cinerascenti-tomentellis; racemis cymuligeris elongatis axillaribus et lateralibus, aggregatis; drupis ellipticis, pollicaribus.—In Brasilia in ditione Japurensi.

The above character agrees so well with *Abuta* as to justify its position in this genus.

§ 2. *Batschia*: *folia minus coriacea, subglabra, nervis minus crassis et prominentibus; stamina fertilia in ♂ pilosa: arbusculæ erectæ.*

11. *Abuta racemosa*, *Tr. & Pl. Ann. Sc. Nat.* 4 sér. xvii. p. 48;—*Batschia racemosa*, *Thunb. Nova Act. Ups.* v. 120, tab. 2. fig. 1; *Usteri Ann.* tab. 10. fig. 1;—*Trichoa racemosa*, *Pers. Ench.* ii. 634; *DC. Prodr.* i. 103;—ramulis junioribus puberulis, demum glabris; foliis oblongis, basi obtusis, apice acuminatis vel obtusis et emarginatis, triplinervis, supra lævibus, sub-lucidis, nervis rufulis nitentibus vix prominulis, subtus opacis, concoloribus, nervis obsolete puberulis, valde prominentibus; petiolo brevi, subpubescente; racemis ♀ axillaribus, solitariis vel geminis, folio brevioribus; pedicellis alternis, imo bracteolatis, 1-floris, in fructu longioribus; drupis amplis, tomentosis.—In Ecuador, *v. s. in herb. Hook.*; Mariquita, Rio Magdalena (Triana).

This species, originally collected at Mariquita by Mutis, was first described by Thunberg, in 1794, as the type of the genus *Batschia*, upon very good details obtained from the examination of male and female flowers; M. Triana's specimens, from the same locality, have ♀ flowers only. The leaves are  $2\frac{1}{2}$ –4 inches long,  $1\frac{1}{2}$ –2 inches broad, on a petiole  $\frac{1}{2}$ – $\frac{3}{4}$  inch long. The ♀ raceme is 3 inches long, the pedicels 2 lines long, the flower in bud 1 line in diam. The fructiferous raceme in Thunberg's drawing is 3 inches long, with about six alternate pedicels about  $\frac{1}{2}$  inch long, each bearing one to three drupes  $\frac{3}{4}$ –1 inch long,  $\frac{5}{8}$  inch broad, enclosing an oblong coriaceous putamen with a bimar-supiate cell and a hippocrepiform seed, as in the true *Abuta* section. It should be remarked that the sterile stamens are perfectly glabrous in the female flower.

12. *Abuta Seemanni*, Tr. & Pl. Ann. Sc. Nat. 4 sér. xvii. p. 50 ; —*Abuta spicata*, Tr. & Pl. l. c. 49 ; —*Batschia spicata*, Thunb. l. c. tab. 2. fig. 2 ; —*Batschia conferta*, nob. in Bot. Herald, 76 ; —*Trichoa spicata*, Pers. l. c. 634 ; —*Trichoa conferta*, DC. l. c. 103 ; —ramulis teretibus, pubescentibus, demum glabris ; foliis ellipticis, utrinque subacutis, opacis, glabris, nitidiusculis, superne convexis, triplinerviis, in sulcis nervorum puberulis, in venis transversis immersis canaliculatis, subtus pallidis, nervis hinc prominentibus, margine cartilagineo revolutis ; petiolo subtenui, apice paulo incrassato, glabro ; paniculis ♂ spicatis racemiformibus, solitariis, axillaribus, gracilibus, folio sublongioribus ; floribus pubescentibus ; rachi, ramis brevibus, pedicellisque bracteolatis ; staminibus 6, fertilibus, insigniter hirsutis, 3 alternis angustioribus ; racemis ♀ (vide Thunb.) axillaribus, spicatis, floribus confertis.—In Ecuador, Mariquita (Mutis) ; v. s. in herb. Hook., Isth. Darien ad "Ardita Bay" (Seemann).

When I first described this species in the 'Botany of the Herald,' I regarded it as being identical with Thunberg's second species of *Batschia*, of which no distinct character had been given. The specimen accompanying Dr. Seemann's plant, with flowers too little developed for determination (suggested as probably the female of the same), is, no doubt, a species of *Smilax*, as Prof. Grisebach rightly judged. MM. Triana and Planchon, who have since also described the species in question, considered it to be specifically distinct from Thunberg's second species ; but, although I have here adopted the name they have given, I cannot accord with their conclusion. The only ground on which they retain *Batschia spicata*, Thunb., as a distinct species is the character related of its spicated inflorescence and the number of its staminodes : there is no specimen known of it, no character given of its general habit, no knowledge of the form or size of its leaves, nor drawing of its inflorescence, to sustain its right to stand distinct from Dr. Seemann's plant. In the details transmitted to Thunberg, the female flower, which appears to have been known only to Mutis and Valenzuela, is described as having three staminodes only, whereas there are six in *Batschia racemosa*. In regard to its more spicate or more simple racemose character, this is a feature of sexual difference only, common throughout the whole family ; and I cannot regard the number of staminodes as a feature sufficiently verified. In the days of Mutis and Valenzuela, the same exactness in observation was not practised as in our days. I was for a moment deceived myself by a similar appearance ; for, on examining a specimen of M. Triana's collection, the first flower analyzed presented the



six staminodes described by Thunberg; but in the second flower, from another specimen of the same, only three staminodes were visible, placed opposite the ovaries. On searching more carefully, I discovered three other, alternate, much shorter staminodes, drawn in between the ovaries and concealed by their long hairs, and which were evidently dwarfed by exceptional growth. The character attributed to *Batschia spicata*, therefore, cannot be considered of any value until it is proved to be permanent and complete. In Dr. Seemann's plant the leaves are  $2\frac{1}{2}$ – $4\frac{1}{2}$  inches long,  $1\frac{1}{4}$ –2 inches broad, on a petiole  $\frac{1}{2}$  inch long. The slender ♂ raceme is  $2\frac{1}{2}$ – $4\frac{1}{2}$  inches long; its alternate short branches 1–2 lines long, which bear three or four nearly sessile alternate flowers. The sepals are like those of *Abuta*; but there is a difference in the stamens, which are six in number; the filaments gradually thicken upwards, and are furnished in front and back with long pilose hairs; the three interior stamens are much broader, the globular anther-cells being affixed on the sides of the broad intervening filament, and burst by a longitudinal fissure; the three outer stamens are somewhat shorter and much narrower, presenting the appearance, described by Thunberg, of being sterilized; but the anther-cells, though smaller, are perfect, and are separated by a narrow compressed filament. We have a very similar character in the following species.

13. *Abuta acutifolia*, nob;—*Abuta* concolor, *Benth. in part. (non Pöpp.)*, *Journ. Proc. Linn. Soc. v. Suppl.* 49;—suberecta, glaberrima; ramulis teretibus, lævibus; foliis elongato-ellipticis, utrinque acutis, apice acuminatis et mucronatis, marginibus subrevolutis, coriaceis, opacis, imo triplinerviis cum nervis alteris 2 e basi enatis mox evanidis; nervis validis rubescentibus nitidis venisque transversis utrinque vix prominulis, reticulatione fere obsoleta, petioloque apice tumido et ruguloso undique glaberrimis; panicula subracemosa, supra-axillari; rachi glabra, petiolo triplo longiore, ramis alternatim 2–3-floris, floribus subtomentosis.—In Guiana Brasiliana, *v. s.*, prope Panurè, Rio Uaupes (Spruce, 2763).

This plant bears no appearance of a climber, being, on the contrary, according to Spruce, a shrub with weak branches, growing on rocks. The branches in my specimen are 1 line in diam., with internodes about  $\frac{3}{4}$  inch, the whole bearing much the appearance of an *Anelasma*. The leaves are 5– $5\frac{1}{2}$  inches long, 2– $2\frac{1}{2}$  inches broad, the petiole ( $1$ – $1\frac{3}{8}$  inch long) being inserted at an angle upon the plane of the leaf. The slender raceme originates at a distance of 3 lines above each axil, is  $3\frac{1}{2}$ –4 inches long, the alternate branches, at intervals of 3 lines, are 2–3 lines long, bearing three alternate flowers on very short

pedicels, the flowers in bud being  $\frac{1}{2}$  line in diam. ; the filaments are covered all over with short rigid hairs, mixed occasionally with longer ones.

#### 17. ANELASMA.

When I proposed this genus, in 1851, for a Brazilian plant, upon a knowledge of the male flower only, its proper position was mistaken, in the absence of the female flower and seed. The examination of a specimen, in fruit, from the West Indies, closely allied to the *Cocculus Domingensis*, DC., figured in Delessert's 'Icones,' led me to infer, from their general appearance, that all these plants belonged to the same genus ; but having obtained very soon afterwards other and more complete specimens, I discovered the true carpological structure of *Anelasma*, and found that the *Cocculus Domingensis* and its allied species appertained to *Hyperbæna*—a genus then placed by me in the dubious section for want of a knowledge of its seminal organization. Dr. Grisebach subsequently pointed out the error as regarded *Hyperbæna*, but this I had discovered and rectified long previously. Some species of *Anelasma* and *Hyperbæna* so much resemble one another in the form and veinless texture of their leaves, as well as in their inflorescence, that they might easily be confounded by a superficial observation ; but more careful examination and an inspection of their floral or carpological structure will remove all doubt, as the differences in these respects are now well established. The liability of falling into error in the determination of such plants, by trusting to mere external characters, has misled so experienced a botanist as Mr. Bentham, who, in his "Notes on *Menispermaceæ*" (Journ. Proc. Linn. Soc. v. Suppl. 49), not only refers all my species of *Anelasma* to *Abuta*, but has made other misconceptions, which I have pointed out. I need not repeat what has already been said (*ante*, p. 79) concerning the opinions of Dr. Grisebach, Mr. Bentham, and Dr. Hooker in regard to the supposed identity of *Anelasma* with *Abuta*, nor recapitulate my reasons for holding them to be distinct. In addition to the many opposite characters there mentioned, another notable difference is worthy of attention : my own observations demonstrate that the species of *Abuta* proper are very lofty climbers, as may be judged from specimens seen in herbaria, while the remarks of others show that those of *Anelasma* form branching erect trees. Gardner says of the typical plant that it is "a small tree ;" and all the other specimens of the genus that I have seen bear the aspect of an erect habit. In every instance seen by me the leaves are perfectly glabrous, and by their nervation and general aspect resemble those of

*Cinnamomum*; they never approach an orbicular, and rarely an oval form, but are usually long and narrow, very thick and coriaceous, both sides being subpolished, owing to the immersion of the nerves and more especially of the veins; they present a peculiar appearance from the manner in which their long and strong petioles (much thickened at their apex and articulated at the base) are inserted at an oblique angle into the plane of the leaf. The male inflorescence consists of several extremely slender branching panicles, fasciculated and issuing from a point above the insertion of the petioles, the rachis and its short branches being almost capillary, black, and glabrous: these branches are also charged, at regular intervals, with 3-4 fasciculated ramifications, that again bear several pedicellated minute flowers, which are glabrous, and black when dried. This is very different from *Abuta*. The female inflorescence is shorter, seldom exceeding the length of the petiole, and consists of one or two simple racemes, with a single flower upon each lengthened and spreading pedicel, bracteated at its origin, all quite glabrous.

ANELASMA, nob.—*Flores* dioici. *Masc.* *Sepala* 6 vel 9, in ordine ternario alterna, oblonga, carnosæ, glabra, 3 interiora majora, obovata, concava, intus striis 2 notata, æstivatione subimbricata. *Petala* nulla. *Stamina* 6, sepalis opposita, subseriata, erecta, conniventia, 3 interiora paulo longiora et latiora: *filamenta* carnosæ, subincurva, sursum incrassata; *antheræ* subglobosæ, apicales, filamento subintrorsum semi-immersæ, rima transversali obliqua 2-valvatim hiantes, sæpius septo valvis parallelo et rarius e septulo cruciformi, 3-4-locellatæ.—*Fœm.* *Sepala* marium. *Stamina* sterilia 6, breviora, circa gynæcium hypogyna, compressa, carnosæ, apice 2-glandulosa. *Ovaria* 3, libera, gibboso-globosa, gynæcio brevi centrali insita, glabra, lucida, carnosæ, 1-locularia, 1-ovulata: *stylus* brevissimus; *stigma* acute et breviter bifidum aut obsoletum. *Drupæ* 3, vel abortu 2-1, siccæ, oblongæ, subgibbæ, glaberrimæ, subnitidæ, imo excentrice stipitatae, styli vestigio a basi haud distante notatæ; *putamen* et *semen* iis *Abutæ* conformia.

Frutices vel arbusculæ *Americæ intertropicæ*, erectæ, ramosæ; ramuli substricti, glabri; folia alterna, oblonga, crasso-coriacea, utrinque glaberrima, nitida, 3-5-nervia (haud penninervia), nervis venisque transversis sæpius immersis, hinc interdum fere evenia; petiolo summo basique valde tumido: paniculæ ♂ racemosæ, plurimæ (3-5), fasciculatæ, supra-axillares, graciles, glabræ; flores numerosi, minuti, glabri: racemi ♀ 1-2, simplices, pauciflori.

1. *Anelasma Gardnerianum*, nob., Ann. Nat. Hist. sér. 2. vii.

p. 43;—*Abuta concolor*, *Benth. in part. (non Pöpp.)*, *Journ. Linn. Soc. v. Suppl.* 49;—erectum, ramulis brunneis, nitentibus, glaberrimis; foliis elliptico-oblongis, basin versus ovaliter angustatis, apice subattenuatis, calloso-mucronatis, crasso-coriaceis, supra lucidis, utrinque pallidis, 3-nerviis, nervis ad apicem fere parallelis, cum binis alteris tenuioribus fere marginalibus, venis transversis superne impressis, subtus prominulis, interstitiis creberrime reticulatis, margine cartilagineo; petiolo glabro, lævi, subcanaliculato, basi summoque breviter valde tumido; racemis ♂ plurimis, fasciculatis, axillaribus, petiolo longioribus; floribus numerosis, minutis; sepalis extus glabris, intus subpruinosis.—In Brasiliæ prov. Goyaz, v. s. in *herb. meo*, Natividade (Gardner, 3567).

This is "a small tree," with terete branches. It is distinguished from *A. concolor*, with which it has been confounded by Mr. Bentham, by its very smooth, polished, flexuose branches, with short internodes (which are seldom more than half an inch), by a more abbreviated petiole, which has a short, thick, almost 2-lobed swelling at its summit, the petiole being  $\frac{3}{4}$  to  $1\frac{1}{2}$  inch long: the leaves, though obtusely narrower, are not broadly rounded at base; they are  $4-5\frac{1}{2}$  inches long,  $1\frac{1}{2}-2\frac{1}{2}$  inches broad, with cartilaginous margins; they are very pale beneath, subpolished, with pallid raised nerves, and covered with prominent extremely fine reticulations, which give them a peculiar appearance. From three to five glabrous racemes, charged with very numerous minute glabrous flowers, spring out of each axil; they are 2 inches long; their slender ramifications, 3 lines long, bear about three alternate flowers, nearly  $\frac{1}{2}$  line in diam., on very short pedicels: the outer sepals are linearly oblong; the three inner ones are much larger, round, acute, concave, and fleshy, with thinner margins, which are imbricated in æstivation; they are perfectly glabrous outside, pruinose within in their upper moiety and on the edges: the stamens, quite glabrous, are connivent in the centre, and are somewhat united at base on a short glabrous receptacle.

2. *Anelasma concolor*, nob.;—*Abuta concolor*, *Pöpp. Nov. Gen.* ii. 64, tab. 188; *Benth. in part. loc. cit.* p. 49;—*Trichoa concolor*, *Endl. Walp. Rep.* i. 95;—*Cocculus lævigatus*, *Mart. Flor.* xxiv., *Beibl.* ii. 45;—glaberrimum, erectum; ramulis fuscis, crebre striolatis; foliis oblongis aut elongato-oblongis, basi rotundis, apice breviter acuminatis et callo-mucronatis, crasso-coriaceis, rigidis, utrinque obscure nitidis, glaberrimis, 3-5-nerviis, nervis supra prominentibus, subtus fere immersis, lateralibus mox evanidis; venis transversis tenuibus, sub lente foveolato-reticulatis; petiolo elongato, striolato, apice longe

incrassato : racemis ♂ 3, fasciculatis, axillaribus, glabris, petiolo subæquilongis ; ramis alternis, gracilibus, 3-floris, ♀ solitariis vel binis, petiolo longioribus ; pedicellis elongatis, patentibus, medio bracteis 2, imo 1 munitis : drupis oblongis, basi obliquis, glaberrimis, flavidis.—In Brasilia tropica, prov. Maynas et Rio Teffé, ♂ et ♀ (Pöppig) ; v. s. ♀ San Gabriel, Rio Negro (Spruce, 2192) ; Barra do Rio Negro (Spruce, Dec. 1850–51, sub nomine *Cocculi lævigati*).

This species differs in many essential respects from the preceding ; but Spruce's plant agrees well with Martius's diagnosis, as well as with Pöppig's description and figure. Mr. Bentham, who refers this species to *Abuta*, confounds it with several other plants. It appears to be a tree with longer and a rougher branches than those of *A. Gardnerianum* ; for they have rugosely striated surface, often verrucose, with internodes of 1–1½ inch ; the leaves are larger, quite rotund at the base, of a duller hue and darker colour, 5–6 inches long, 2¼–3 inches broad ; the petiole is smooth, striated, comparatively double the length of the preceding, 1½–2 inches long, and the apical bourrelet is much longer, more cylindrical, and rougher. The ♂ racemes are 1¾ inch long, and very slender ; the ♀ are mostly solitary, quite glabrous, 2½ inches long, with simple, alternate, 1-flowered, slender pedicels, very patent, 4–6 lines long, bearing two alternate minute bracteoles in the middle and one, much longer, at base, 1 line long, with a tomentose apex ; the flower bears three connivent ovaries, each with a short excentric style and a short bifid stigma ; the drupe is 8 lines long, with a coriaceous, polished pericarp of a yellowish colour. The form of anther and the mode of its dehiscence which characterize this genus are well shown in Pöppig's figure.

3. *Anelasma Martinianum*, nob. ;—*Abuta* concolor, *Benth. in part. l. c. p. 49 (non Pöpp.)* ;—ramulis teretibus, lævibus, substriatis ; foliis elliptico-oblongis, imo cuneato-angustatis, supra nitidis, pallide viridibus, subtus pallidioribus, apice breviter et abrupte acuminatis, crasso-coriaceis, utrinque glaberrimis, imo 3-nerviis eum alteris binis basalibus mox in marginem evanidis, nervis venisque transversis supra omnino immersis, subtus vix prominulis ; petiolo glabro, tereti, canaliculato, imo apiceque tumido, limbo 7–8-plo brevior ; racemis ♂ binis vel pluris, supra-axillaribus, capillaribus, glaberrimis, petiolo 2–3-plo longioribus ; floribus minutis, longe pedicellatis, glabris ; racemis ♀ solitariis, axillaribus, petiolo subæquilongis, paucifloris ; drupa glabra, nitida.—In Cayenne, v. s. ♂ in herb. *Mus. Brit. et Hook.* (Martin), ♀ in herb. *Hook.* (Martin).

The branches are rigid; the leaves are  $4\frac{3}{4}$ – $5\frac{3}{4}$  inches long,  $2$ – $2\frac{1}{2}$  inches broad, on a stiff petiole, 8–10 lines long. The male racemose panicles, on a very slender rachis  $2$ – $2\frac{1}{2}$  inches long, have several capillary short branches, with very minute flowers. The fructiferous branches, scarcely more than 1 inch long, on a slender flexuose rachis, bear a few 1-flowered pedicels, 3 lines long, supporting a glabrous drupe 10 lines long.

4. *Anelasma Guianense*, nob.;—*Abuta concolor*, *Benth. in part. l. c. p. 49* (*non Pöpp.*);—ramulis teretibus, obsolete striatis, nitidis, rubescentibus, verruculis albidis signatis; foliis ovalibus, basi late rotundatis, fere truncatis vel subcordatis, apice gradatim acutis, crasso-coriaceis, utrinque nitidis, subopacis, 5-nerviis, nervis rubescentibus, superne immersis, exterioribus ultra medium extensis et tunc cum venis arcuatim nexis intramarginalibus, superne venis transversis immersis, inferne creberrime reticulatis, margine cartilagineo; petiolo basi apiceque longe incrassato; racemis ♂ 3–4, supra-axillaribus, valde elongatis, ramosis, glaberrimis; rachi nitida, graciliter striolata, rubente; pedicellis capillaribus; floribus numerosis, minutis.—In Guiana Britannica, *v. s.* (Schomburgk, 440).

This differs from *A. concolor*, with which it has been confounded, in its much broader leaves, extremely rounded and almost subcordate at base, with petioles and short internodes as in *A. Gardnerianum*, and also in its much longer and more compound racemes. The branches are stouter,  $2\frac{1}{2}$  lin. in diam., quite polished, reddish brown, spotted with white oblong tubercular lenticels, the internodes being  $\frac{1}{2}$ –1 inch. The leaves are  $4\frac{1}{2}$ – $5\frac{1}{4}$  inches long,  $2\frac{3}{4}$ –3 inches broad; the two principal nerves are united at the base with the midrib for a short distance, the two more external basal nervures running at some distance from the margin to a point beyond the middle, when they anastomose with the veins; they are immersed in the fleshy parenchyma, and are of a reddish colour; the under surface is very finely reticulated with prominent veins; the petioles are somewhat elongated, finely striated, reddish, 1– $2\frac{1}{2}$  inches long, with an elongated, channelled, rugose, dark bourrelet at the apex; the ♂ racemes 3–4, fasciculated and supra-axillary, with a very slender polished rachis, 7–8 inches long, and many alternate capillary divaricated ramifications, 4–6 lines long, with secondary branchlets, 3 lines long, each branching again, with ultimate pedicels bearing a minute flower, all the articulations being bracteolated; the flowers are glabrous, scarcely  $\frac{1}{2}$  line in diam. in bud; the sepals have pruinose margins, overlapping in æstivation. The ♀ raceme is simple,  $2\frac{1}{4}$  inches long, with alternate pedicels 3–4 lines long, each bearing three ovaries.

5. *Anelasma Sellowianum*, nob. ;—*Abuta*, sp., *Benth. l. c.* p. 49 ; —ramulis teretibus, glabris, lævibus ; foliis elongato-ellipticis vel lanceolato-oblongis, utrinque acutis, subcoriaceis, glaberrimis, imo trinerviis cum 2 alteris basalibus mox evanidis, utrinque crebriter reticulato-punctatis, supra nitidis, subtus opacis, nervis tenuibus vix prominulis ; petiolo elongato, tenui, nitido, apice longiuscule incrassato, glabro ; paniculis ♂ subracemosis, 2 vel 3, supra-axillaribus, gracilibus, petiolo longioribus ; rachi glabra, compressa, striata ; floribus minutis, bracteis sepalisque exterioribus pubescentibus, cæteroquin glabris.—In Brasilia, *v. s. in herb. Hook.* (Sellow).

Its locality is not mentioned, but it is most probably from one of the central provinces. It is a very distinct species ; its leaves, of a laurel-like aspect, are  $3\frac{1}{2}$ – $4\frac{1}{2}$  inches long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch broad, on a petiole  $1\frac{1}{4}$ – $1\frac{3}{4}$  inch long ; the ♂ raceme-like panicles are  $1\frac{3}{4}$ – $3\frac{1}{2}$  inches long, the rachis being slender, black, and quite glabrous ; the bracts are pubescent ; the ultimate pedicels and bracteiform sepals are scabridly puberous, the inner sepals glabrous : in their structure the stamens are like those of the other species ; the globular anther is sulcated in front, the dehiscence being at first lateral, owing to the adhesion of a central point, which soon gives way, when it opens into two gaping valves, in conformity with the general structure, the anther being apicifixed, without any intervening connective.

6. *Anelasma Spruceanum*, nob. ;—*Abuta* concolor, *Benth. in part. l. c.* p. 49 (*non Pöpp.*) ;—ramulis teretibus, nitidis, lenticellis notatis, glabris, vix striatis, axillis nodosis ; foliis ellipticis, basi cuneatis, apice repente attenuatis, cuspidato-mucronatis, marginibus reflexis, glaberrimis, firmiter chartaceis, pallide viridibus, subtus pallidioribus, 3–5-nerviis, nervibus 3, prominulis, 2 lateralibus tenuibus, fere marginalibus et mox evanidis, venis transversis utrinque prominentibus et anastomosantibus ; petiolo valde tenui, canaliculato, apice basique longiuscule incrassato ; racemis ♂ 2–3, fasciculatis, axillaribus, gracilibus, petiolo longioribus, glabris, bracteolis membranaceis ciliatis ; sepalis intus marginibusque puberulis.—In prov. Amazonas : *v. s. in herb. variis* ; inter Santarem et Obidos (Spruce, Dec. 11, 1849, “*affin. Cocculus levigatus, Mart.*”).

A species near the last, but with larger, broader, and more cuneate leaves. The petioles are more slender, and its racemes are perfectly glabrous. In many respects it differs essentially from *A. concolor* : its branches are smooth and obsoletely striated ; its leaves are very different in form, are 5 inches long,  $2\frac{1}{2}$  inches broad, the petiole being  $1\frac{1}{4}$  inch long, finely striated, canalicu-

lated, with a lengthened and more slender bourrelet, and a very tumid base; the racemes are extremely slender, 2 inches long, their capillary ramifications, 2 lines long, bear three small pedicelled flowers.

7. *Anelasma pallidum*, nob.;—*Anelasma laurifolium*, Sagot, MS. (*non nob.*);—*Abuta concolor*, Benth. in part. l. c. (*non Pöpp.*);—ramis lenticellato-rugosis; ramulis teretibus, obsolete striatis, glaberrimis; foliis elongato-ellipticis, utrinque acutis, apice subbreviter acuminatis, obsolete mucronatis, e basi trinerviis cum nervulis binis margine contiguis mox evanidis, utrinque pallidis, glaberrimis, crassis, coriaceis; nervis venisque transversis superne prominulis, subtus immersis, paulo prominulis, interstitiis vix reticulatis, margine cartilagineo, paulo reflexo; petiolo glabro, brevi, crasso, ruguloso, imo tumido, apice clavato et superne sulcato; racemis ♂ 1–2–3, fasciculatis, axillaribus, tenuissimis, glabris, petiolo triplo longioribus; ramis capillaribus alternatim trifloris; pedicellis fasciculatis; floribus glaberrimis.—In prov. Rio Amazonas: v. s. ♂ Barra do Rio Negro (Spruce, no. 1829), ♀ in herb. Hook., Karoung, Guyane Française (Sagot, no. 20, sub nom. *Anelasma laurifolium*).

The same species, collected by Pöppig, exists in some herbaria under the name of *Cocculus glaber*. It resembles the preceding in the acute extremities of its leaves, in which respect both differ from *A. concolor*, with which they have been confounded; the leaves are larger than in the preceding species, much thicker, smoother, with shorter and stouter petioles, and with racemes of double the length. The branches are 2 lines and the branchlets 1 line in diam., with internodes about  $\frac{3}{4}$  inch long; the leaves, with both surfaces remarkably smooth, are  $5\frac{1}{2}$  inches long,  $2\frac{1}{4}$ – $2\frac{1}{2}$  inches broad, on a petiole 8–10 lines long; the racemes are about 3–5 inches long, the branches 3 lines, the pedicels 2 lines, the flowers  $\frac{1}{2}$  line in diam., all glabrous.

8. *Anelasma strumosum*, nob.;—*Abuta*, sp., Benth. l. c. p. 49;—ramulis teretibus, lævibus, sub lente rugulosis; foliis ovalibus, basi late rotundatis, apice repente breviter et anguste acuminatis, acumine obtusiusculo, supra fuscis nitentibus, nervis venisque transversis immersis, subtus pallidioribus et opacis, imo triplinerviis, cum nervis alteris binis basalibus valde conspicuis ad medium in marginem evanescentibus, venis reticulatis, prominulis; petiolo elongato, striato, valido, apice longissime et fortissime tumido et tortuoso; racemis ♀ solitariis vel binis, supra-axillaribus, petiolum superantibus; pedicellis alternis, brevibus, 1-floris, in fructu incrassatis; drupis ovali-



bus, glabris.—In prov. Rio Negro, *v. s.*, San Gabriel da Cachoeira (Spruce, no. 2393).

This is certainly distinct from all the preceding species; its fuscous, opaque branches have internodes 1–2 inches long; the shining and very thickly coriaceous leaves are fuscous, 5–6 inches long,  $3\frac{1}{2}$ – $4\frac{1}{4}$  inches broad, on a petiole  $1\frac{1}{2}$ –2 inches long,  $\frac{3}{4}$  line in diam., the apical bourrelet being 9 lines long, 2 lines in diam.; the raceme is  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches long, the fructiferous pedicels 1–2 lines long; the glabrous oval drupes, upon an excentric stipitate support, are nearly 1 inch long,  $\frac{1}{2}$  inch broad, somewhat excentrically apiculated by the remnant of the style.

9. *Anelasma intaminatum*, nob.;—ramulis glabris, striatis, teretibus, lævibus, fusco-brunneis, lenticellis oblongis signatis; foliis elliptico-oblongis, imo fere rotundatis, apice breviter attenuatis, acumine obtusiusculo, e basi trinerviis, cum nervis 2 alteris mox evanidis, rigide coriaceis, fusco-viridibus, margine revoluta, utrinque glaberrimis, supra lucidis, nervis semiimmersis, sub lente foveolato-reticulatis, subtus fr̄scis, fere eveniis, nervis paulo prominulis, nitentibus; petiolo fere recto, rigidiusculo, imo apiceque valde tumido, fusco, glabro, striato, e cupula magna enato, limbo triplo brevior.—Circa Rio de Janeiro, *v. s. in herb. Mus. Brit.*, in sylvis (Bowie & Cunningham).

The specimen is without flower or fruit, although Cunningham sent home its drupes, which are not to be found now. It approaches the last species. Its very thick rigid leaves are 5– $5\frac{1}{2}$  inches long, 2– $2\frac{1}{4}$  inches broad, on a very stiff petiole  $1\frac{3}{4}$  inch long.

The two following plants are unknown to me; they appear to belong to this genus, from the short characters given of them.

10. *Anelasma urophyllum*;—Cocculus urophyllus, *Mart. Flor.* xxiv. *Beibl.* ii. 45; *Walp. Rep.* ii. 749;—erectum, glaberrimum, foliis coriaceis, oblongo-lanceolatis vel anguste oblongis, acute cuspidatis, basi cuneatis, 3–5-nerviis, nervis lateralibus tenuibus marginantibus mox evanidis, supra nitidis; racemis quam petioli brevioribus; drupis ellipticis, fere pollicaribus.—Minas Geraës Brasilæ.

These characters, although quite in general conformity with the several species already described, do not specifically accord with any one of them.

11. *Anelasma laurifolium*;—Cissampelos laurifolia, *Poir. Dict.* v. 11; *DC. Syst.* i. 539;—ramis sarmentosis, ramulis pen-

dulis, glabris, nitidis, subflavescentibus ; foliis ovato-oblongis, obtusis, crasso-coriaceis, integerrimis, glabris, utrinque subnitidis, subtus costa prominente ; petiolo brevi, crasso ; racemis ♀ brevibus, axillaribus ; drupis ovatis, basi angustatis, pulposis, rugosis, nucis magnitudine, siccis fusco-nigrantibus.—In ins. Sanct. Thomasii (Richard).

The above description quite conforms with the habit of *Anelasma* ; no other account is given, except that the leaves are like those of a Laurel, only larger.

The *Anelasma minutiflorum*, Sagot, is *Hyperbæna minutiflora*, nob., *Hyperbæna reticulata*, var., Benth. (non nob.).

#### 18. HYP SERPA.

This genus consists of a distinct group of plants, natives of Asia and the islands of the Oriental archipelago, the type of which is the *Cocculus cuspidatus* of Wallich. It is distinguished from *Cocculus* by its cyclical slender embryo imbedded in simple albumen, in which respect it approaches *Pericampylus* ; but it differs from that genus and all others of the *Leptogoneæ*, except *Limacia*, in its cotyledons being accumbent (not incumbent). It is also notable for its unsymmetrical flowers ; for few of its species agree in the number of sepals, petals, stamens, or ovaries—a very unusual occurrence in the order. The authors of the 'Flora Indica' and of the new 'Genera Plantarum' have refused to admit the validity of the genus, as they do not consider the imbrication of its inner sepals to be a character of any importance ; and therefore they unite it with the genus *Limacia* of Loureiro. In this hasty determination they have entirely overlooked other circumstances which establish marked distinctions between the two genera. In all the species of *Limacia* the sepals are constantly thick and valvate in æstivation, while in every case in *Hypserpa* the sepals have broad, thin, membranaceous margins, which sometimes for half their breadth overlap each other in æstivation. In other families where the difference is so extremely salient as it is in these instances, it is allowed to be a good generic distinction ; and there is no reason for denying its validity in *Hypserpa*, especially as it is accompanied by other prominent points of divergence. In *Limacia* the stamens are equal in number to the petals, whose lateral lobes entirely embrace the filaments, which are affixed to their claws ; they are always in ternary series, and symmetrical, the numbers being constantly six in one group, and as regularly three in the other section ; the number of ovaries is constantly three. In *Hypserpa*

there is no symmetry whatever in any of its parts; the sepals vary in number in the different species; and the petals are equally variable, being four, five, or six, and they do not embrace the filaments, though their sides curve inwards; the number of stamens is always in excess of the petals, being generally six, seven, or eight, and in one instance I found nine; in some species the ovaries are three, rarely six, and in two species constantly two. In *Hypserpa* the embryo is very slender and terete; in *Limacia* it is somewhat broader, flatter, and loriform. In *Hypserpa* the radicle is equal in length to, or somewhat longer than, the cotyledons; in *Limacia* the radicle is only a quarter of their length. These valid differences, which I have constantly found in all the cases that have fallen under my observation, unquestionably establish the claims of *Hypserpa*. The same authorities, after their usual method, annihilate all the species of *Hypserpa*, except the type, ignoring all the remainder; while I have here enumerated nine species.

**HYPSPERPA**, nob.—*Flores* dioici. *Masc. Sepala* numero vario, 8, 9, usque ad 12, 2-3-serialia, quorum exteriora bracteiformia, 5-6 interiora majora, oblonga, marginibus late membranaceis erosis et ciliatis, æstivatione imbricata. *Petala* 6, 5, vel 4, sepalis paulo minora, obovata, carnosula. *Stamina* 6 ad 10, biseriata, quorum 4, 5 vel 6 exteriora, reliqua centralia; *filamenta* carnosula, subcompressa, incurvata, apice incrassata; *antheræ* 2-lobæ, lobis ovatis, distinctis, subobliquis, apice filamenti subimmersis, latere exteriori rima longitudinali dehiscentibus. *Fœm. Sepala* 8, oblonga, crassiuscula, margine membranacea, imbricatim disposita, quorum 2 exteriora bracteiformia. *Petala* 5-6, oblonga, concava, carnosula. *Stamina* sterilia 6, cum petalis gynæcio inserta, apice clavata, antheris subobsoletis. *Ovaria* 6, rarius 3, interdum 2, gynæcio centrali insita; *stylus* brevissimus; *stigma* oblongo-lineare, profunde canaliculatum, subtrilobum, vel incisum. *Drupa* abortione 2-3, transversim ovata, carnosæ, styli vestigio basi propinquo notatæ: *putamen* valde osseum, subglobosum, paulo compressum, peripheriam versus utrinque radiatim sulcatum, carina peripherica lævi; 1-loculare, loculo lunato circa condylum gyrate; *condylus* excentricus, intus septulo integro 2-cameratus, utrinque meatu lineari parvo extus perforatus; *semen* loculo conforme, dorso angulatum, ventre subplanum; *integumenta* tenuia, medio *raphes* ventralis prominentis linearis condylo affixa; *embryo* intra *albumen* simplex copiosum carnosum fere annulosum tenuiter elongatus, omnino teres, *cotyledonibus* accumbentibus, ad hilum tensis, *radiculæ* superæ ad stylum spectanti æqualibus, vel subbrevioribus.

Frutices scandentes Asia tropica et insularum indigenæ; folia elliptica, sæpius glaberrima, 3-nervia, breviter petiolata; racemi axillares, petiolum æquantes, vel duplo longiores.

1. *Hypserpa cuspidata*, nob. Ann. Nat. Hist. ser. 2. vii. 40;—*Cocculus cuspidatus*, Wall. Cat.;—*Limacia cuspidata*, Hook. & Th. Fl. Ind. i. 189;—ramulis subteneribus, teretibus, striatis, subpubescentibus; foliis ovato-oblongis vel oblongo-lanceolatis, imo rotundatis vel obtusis, apice attenuatis et mucronato-cuspidatis, canaliculatis, coriaceis, imo trinerviis, nervoque marginali revoluta, utrinque glabris, reticulatis, supra in venis sulcatis, subtus pallidioribus, nitidis, nervis prominulis subpuberulis; petiolo brevi, tenui, pubescente; panicula ♂ puberula, brevi, axillari, ramis inferioribus trifloris, vel racemo simplici, paucifloro, petiolo subæquilongo; sepalis 8–9; petalis 4, 5 aut 6; staminibus 7, 8 vel 9: racemo ♀ axillari, trifloro, petiolo æquilongo.—In Indiæ peninsula et Ceylon: *v. s. in herb. Soc. Linn.* ♂, Sylhet (Wall. Cat. 4960; *in herb. Hook.*, Mergui (Griffith), Ceylon (Gardner, 30; Thwaites, 1051; Walker); *in herb. Mus. Brit.*, Assam (Griffiths, 571).

This species is very variable in the size of its leaves, which are 3–4½ inches long, 1½–2¼ inches broad, on a petiole  $\frac{5}{8}$ – $\frac{7}{8}$  inch long. The ♂ racemes are  $\frac{3}{4}$ –1 inch long. The flower consists of three minute external, bracteiform sepals, five to six inner larger submembranaceous sepals in a single imbricating series, generally five shorter fleshy petals, and seven or eight, rarely nine, stamens in the middle. The ♀ fructiferous raceme is only 3 lines long, two of the flowers being sterile; a single drupe only is matured, about the size of a pea, which is thus supported on a short simple peduncle.

2. *Hypserpa nitida*, nob. in Hook. Kew Journ. iii. 258;—*Limacia cuspidata*, Hook. & Th., *in parte, l. c.* p. 190;—ramulis striolatis, parce ferrugineo-tomentosis; foliis ovatis, subacutis, acumine obtuso vix mucronato, utrinque nitidis, fuscis et glaberrimis, trinerviis, nervis venisque reticulatis, supra omnino immersis, subtus prominentibus; petiolo tenui, apice crassiore, superne pubescente, inferne glabro; racemis ♂ brevibus, axillaribus, simpliciter trifloris, floribus pedicellatis, vel in ramulis novellis foliis delapsis aut abortivis paniculam racemosam folio 2–3-plo longiorem efformantibus; racemis ♀ axillaribus, petiolo brevioribus, sæpius simpliciter trifloris; drupa globosa.—In Hong Kong, *v. s. in herb. Benth. & Hook.* (Champion).

It is not easy to conceive a sufficient reason why this very

distinct species should have been confounded with the preceding one by the authors of the 'Flora Indica.' The leaves are  $1\frac{1}{2}$  inch long, 10–11 lines broad, on a petiole 4–5 lines long; they are of a dark fuscous hue, somewhat coriaceous and shining, much broader and more oval in proportion; their apical attenuation is very short, abrupt, broad, and very obtuse, with an obsoletely mucronate point; and the petiole is longer in proportion. The ♂ raceme is 4–5 lines long; the flowers have two external bracteiform sepals, three intermediate and four inner larger membranaceous sepals with ciliated margins, five subequal, subfleshy, ovate petals, and seven stamens (three of which are more exterior and shorter), all fixed on a small central andrœcium. The fructiferous raceme is only 2 lines long, bearing (by abortion) a single subglobular drupe, nearly half an inch in diam. The putamen and seed as in the other species.

3. *Hypserpa prævaricata*, nob.;—ramulis virgatis, glabris, striatis, junioribus flavido puberulis; foliis oblongo-lanceolatis, utrinque sensim attenuatis, mucronatis, glaberrimis, concoloribus aut subtus paulo pallidioribus, marginibus revolutis, quintuplinerviis, nervis venisque valde reticulatis, tenuissimis, prominulis; petiolo puberulo, limbo sextuplo brevior; racemo ♂ axillari, pubescente, e fasciculo pilorum supra-axillari enato, petiolo æquilongo, 3–5-floro; racemo ♀ petiolo longiore, 5–6-floro; ovariis geminis; stigmatibus sessilibus, reflexis, margine 5-dentato.—In insulis Indiæ orientalis: *v. s. in herb. Mus. Brit.* ♂ Pulo Penang; *in herb. Hook.* ♀ Ins. Philipp. (Cuming, 1252).

This species approaches *H. cuspidata*, and may be recognized by its more lanceolate leaves, acute at both extremities, the two principal basal nerves being less pronounced and triplinerved, with branching veins which anastomose with two other outer parallel nervures, and these, again, anastomosing with the pair of nerves always confounded with the margin. In *H. cuspidata* we do not find this intermediate pair of basal nerves. The surface of the leaves are less polished than in the typical species: it is also notable for its very short and few-flowered racemes, and the number of its floral parts.

The leaves are  $2\frac{1}{2}$ – $3\frac{1}{4}$  inches long,  $\frac{7}{8}$ – $1\frac{1}{2}$  inch broad, on a petiole 6–9 lines long. The ♂ raceme is 1 inch long; its flowers have three bracteiform as well as five larger sepals, and five small cuneately oblong, fleshy petals, whose margins are scarcely inflected, and nine or ten stamens in the centre. The ♀ raceme is  $\frac{1}{2}$ – $\frac{3}{4}$  inch long; its flowers have two bracteiform and five larger inner sepals, which are rounded, concave, submembranaceous, pellucido-punctate, with ciliated margins, four or

five deeply concave fleshy petals, and two ovaries, with a sessile, reflexed, obsoletely 3-lobed stigma, both glabrous, and seated on a raised hairy gynæcium.

4. *Hypserpa funifera*, nob.;—alte scandens; ramis funiformibus, longissimis, aphyllis, undique floribundis, ruguloso-tuberculatis; ramulis opace brunneis, striatis, glabris; foliis oblongis, imo rotundatis, gradatim acutis, apice acuminato canaliculatum recurvo, imo vix trinerviis, pinnato-nervosis, marginibus subundulatis, utrinque glaberrimis, supra pallide viridibus, reticulatis, subtus pallidioribus, nervis prominulis flavescentibus; petiolo tenui, substriato; racemis ♂ in ramis pristinis ad nodos annotinos plurimis et fasciculatis, vel in ramulis solitariis et supra-axillaribus, petiolo longioribus, pedunculo trifloro; floribus viridibus, sessilibus; sepalis 8-9, ovalibus, quorum 3 interioribus duplo majoribus, marginibus membranaceis, ciliato-erosis; petalis 5-6, sagittato-ovatis, longe unguiculatis, marginibus inflexis; staminibus longissimis, 6-7, imo coalitis, cum altero centrali brevioribus informi.—In Africa centrali: *v. s. in herb. Hook.*, Mangoman, Manganja Hills (C. J. Mellor).

This species was found, in the locality above quoted, by the botanists who accompanied Dr. Livingstone to the Lake Nyassa, where it bears the name of "Kandama roube." It is said to be "a climber with thick stems, twisting round others like a rope, which are without leaves, 30-40 feet high, everywhere thickly loaded with flowers of a green colour." The leafless floriferous branch is 4 lines in diam.; the straight leaf-bearing branchlets are 1 line thick; the leaves are 4 inches long,  $2\frac{1}{8}$  inches broad, on a petiole  $\frac{3}{4}$ -1 inch long; the axillary racemes are 1-2 inches long, the pedicels 2 lines long, divaricated, glabrous; the flowers are minute; the fasciculated racemes of the older branches are tomentose,  $2\frac{1}{2}$  inches long, their alternate branches 2 lines long, bearing on their apices three sessile flowers, each having at its base a bract; it has three bracteiform, three somewhat larger ovate, and three inner opaque obovate sepals, which are two or three times as large, with eroded margins, the margins of all being ciliated; they have five or six half-ber-shaped petals, half or one-third the length of the inner sepals, their apex sometimes bidentate, with inflexed margins and a very slender claw; six or seven stamens with slender filaments longer than the inner sepals, and a central club-shaped mass terminated by two glandular bodies, looking like two confluent abortive stamens.

5. *Hypserpa heteromera*, nob.;—ramulis scandentibus, teretibus, striatis, puberulis; foliis lanceolato-oblongis, imo subobtusis,

apicem versus sensim acutioribus, mucronatis, pinnato-nervosis, vel remote a basi triplinerviis, utrinque fusco-nitidis et glaberrimis, valde reticulatis, sub lente ruguloso-punctatis, nervis teneribus venisque paulo prominulis; petiolo brevissimo, subpubescente: paniculis ♂ subracemosis, supra-axillaribus, solitariis, gracilibus, puberulis, folio dimidio brevioribus; ramis alternatim subtrifloris, bracteatis, bracteis subulatis; floribus majusculis; sepalis 3 bracteiformibus, 4 interioribus multo majoribus, obovatis, submembranaceis, glabris, maculato-pictis; petalis 6, fuscis, minoribus, subinæqualibus; staminibus 7, liberis, in andrœcium congestim fasciculatis.—*Borneo, v. s. in herb. Hook., Barmassing (Motley, 710).*

This is distinguished from the typical species by its narrower, acute but not acuminate leaves, by their nervation, by its much shorter petioles, and by the number of the floral parts. The leaves are 4 inches long,  $1\frac{1}{4}$  inch broad, on a petiole 3 lines long; the ♂ raceme is  $2-2\frac{1}{4}$  inches long, its branches 3 lines, and their three alternate pedicels 1-2 lines long; the three outer sepals are minute, dark, with ciliated margins; the four inner sepals quite glabrous, submembranaceous, marked with numerous coloured linear spots; the petals, half their length, are fuscous; the filaments are of the same length, slender, and aggregated on a short central receptacle.

6. *Hypserpa propensa*, nob.;—ramulis flexuosis, teneribus, tetratis, striolatis, subtomentosis; foliis oblongis, imo obtusis, vel rotundatis, gradatim acutis, apice breviter attenuatis, acumine obtusiusculo mucronato, subcoriaceis, supra nitidis, utrinque bullato-rugosis, obsolete pilosis, præsertim in nervis, subtus paulo pallidioribus; petiolo brevi, pubescente: racemis ♂ simplicibus, supra-axillaribus, solitariis, folio triplo vel dimidio brevioribus; ramis brevissimis, 1-3-floris; floribus subsessilibus; sepalis exterioribus bracteiformibus 3, interioribus 4 duplo majoribus, membranaceis, margine ciliatis; petalis 4, inæqualibus, subcarnosulis; staminibus 7-8.—*Borneo, v. s. in herb. Hook., Barmassing (Motley, 179).*

This is a trailing shrub, found in low jungle. The leaves are  $2\frac{3}{4}-4$  inches long,  $1\frac{1}{2}$  inch broad, on a petiole 4-7 lines long; the ♂ raceme is 1- $1\frac{1}{2}$  inch long.

7. *Hypserpa pauciflora*, nob.;—ramulis teneribus, striatis, axillis e petiolo deciduo cupuloso-nodosis; foliis imo obtusis, gradatim attenuatis, acumine lineari, obtusulo, longe mucronato, triplinerviis, utrinque glabris, nisi fuissent in nervis subtus puberulis; petiolo tenui, limbo sextuplo brevioribus; racemis ♂ axillaribus

binis vel solitariis, petiolo æquilongis, 3-4-floris; floribus pedicellatis; sepalis 8-9, quorum 5 exterioribus multo minoribus, margine ciliatis, bracteiformibus, 3-4 majoribus, interioribus, ovatis, glabris; petalis 5, cuneato-oblongis, paulo brevioribus; staminibus 6-7, petalis æquilongis.—Ceylon, *v. s. in herb. Hook.* (in sched. cum *H. cuspidata*) *et in herb. meo* (Gardner).

The branchlets are more slender and more virgate than in *H. cuspidata*, the leaves more lanceolate; the racemes are shorter, with fewer flowers, which are much smaller; the leaves are 2-2½ inches long, 6-8 lines broad, on a petiole of 3 lines: the ♂ racemes are 4-5 lines long, the pedicels 1½ line; the very small flowers have five outer bracteiform and three or four inner larger imbricated sepals, five petals, and six or seven stamens.

8. *Hypserpa triflora*, nob.;—*Cocculus triflorus*, *DC. Syst. i. 529, Prodr. i. 99*;—*Limacia microphylla*, *Miq.*;—ramis scandentibus, teretibus, nitidis, glabris, striatis; ramulis divaricatis, rectis, cano tomentellis; foliis parvis, oblongis, utrinque acutis, mucronulatis, undique fusco-viridibus, nitidis, glaberrimis, pinnato-nerviis; petiolo tenui, brevissimo, limbi vicesima parte longitudinis: panicula ♂ axillari, dichotome ramosa, 2-4-flora; folio 4-6plo brevior; sepalis 9, quorum 3 interioribus majoribus, concavis, ovatis, cunctis glabris; petalis 6, brevioribus, oblongis; staminibus 9.—Sumatra, *v. s. in herb. Hook.* ♂ (Teysmann, sub nom. "*Limacia microphylla*, *Miq.*"). ♀ *sec. cl. DC. in herb. Mus. Paris. e Java* (Commerson).

This species greatly resembles *H. prævaricata* in the shape of its much smaller leaves; but these differ in being almost sessile, the petiole being extremely short: the flowers have the same number of stamens; but their sepals are all quite glabrous. The male plant is evidently a climber, with straight rigid branchlets, and with axils 10 lines apart: the leaves are dark, subcoriaceous, and rigid, 1½-1¾ inch long, 6 lines broad, on a petiole 1 line long; the panicle is about 6 lines long, the pedicels 2 lines long, having a minute bract at base.

9. *Hypserpa uniflora*, nob.;—ramulis teneribus, striatis, glabris; foliis oblongis, imo rotundatis, apicem versus gradatim acutis, acumine mucronato, supra basin triplinerviis, nervis tenuibus, reticulatis, pallide viridibus, utrinque glaberrimis; petiolo tenui, vix puberulo, limbo 4-5-plo brevior; pedunculis ♀ axillaribus, solitariis, unifloris, petiolo dimidio brevioribus, pubescentibus, alternatim tribracteolatis; staminibus nullis; ovaris binis, glabris; stylo brevissimo, crasso; stigmatate lato,



reflexo, convexo, integro, acuto.—Ceylon, *v. s. in herb. Hook.*  
(Walker, sub. nom. "*Cocculus cynanchoides*").

In its general appearance this plant approaches nearest to *H. pauciflora*: its branches are very slender, with axils  $\frac{3}{4}$  inch apart; its leaves 2 inches long, 9–13 lines broad, on a petiole 5 lines long; peduncle 3 lines long, with three alternate pubescent bracts in the middle; the flower in bud is 1 line in diam., with three minute pubescent bracts at the base, eight glabrous submembranaceous sepals, with ciliated margins, unequal in size; two small, thick, fleshy, placentiform petals; no stamens; two erect, gibbous, glabrous ovaries, with a convex, acute, reflexed stigma. This plant is very different from the *Cocculus cynanchoides*, Presl, which is a species of *Nephroica*.

#### 19. LIMACIA.

In describing *Hypserpa*, I have shown it to be very distinct from *Limacia*, with which it has been confounded by the authors of the 'Flora Indica' and the 'Genera Plantarum.' In habit there is a certain degree of resemblance between them; but in their floral structure there is a positive want of compatibility. In *Limacia* the male flowers are constantly isomerous, the inner row of sepals consists of three; they are thick, fleshy, pilose on both sides, with a decidedly valvate æstivation; the petals are invariably six, and embrace as many stamens standing opposite to them; there is, however, a distinct group in which only three stamens are present, but the flowers are still isomerous: rudiments of three or six ovaries are found in the centre of the flower, which are not seen in *Hypserpa*. In this latter genus the flowers are always heteromerous, the more membranaceous sepals are conspicuously imbricated in æstivation, and there are many other discrepant characters which it is not necessary to repeat here, as they have been already described. *Limacia* will therefore maintain its ground, distinct from *Hypserpa*, within the limits I pointed out thirteen years ago; but as at that period I had not seen the fruit, *Limacia* was then placed among the *Pachygoneæ*, in accordance with the meagre details of its structure given by Loureiro. When I first noticed this group of plants, I named it *Stereoclea*, on account of the peculiar æstivation of its sepals; but on seeing Loureiro's plant in the British Museum, I instantly recognized it as the same: the previous name was therefore made to indicate the triandrous section, which for the present is retained in the genus, but which probably will turn out to be distinct when its fruit is known. There is a general analogy between *Limacia* and *Hypserpa* in

the form of the putamen, the kind of condyle, and the structure of the albuminous seed; the former has the same accumbent cotyledons as the latter; but the entire embryo is broader and more flattened, and there is a difference in the relative lengths of the radicle and cotyledons. The authors of the 'Flora Indica' and of the 'Genera Plantarum' place *Limacia* in the same tribe with *Cocculus*; but it cannot consistently remain there, owing to the peculiar structure of the embryo. The species of *Limacia* are distributed through tropical Asia, the Eastern archipelago, China, and Japan; but the botanists above mentioned record only three of them.

*LIMACIA*, Lour.—*Flores* dioici. *Masc. Sepala* 9, in ordine ternario alternatim disposita, 6 exteriora minora, bracteiformia, 3 interiora majora, concava, subrotunda, utrinque sericea, æstivatione arcte valvata, dein apicibus reflexis, marginibus basalibus conniventibus. *Petala* 6, subbiserialia, obovata, unguiculata, sepalis multo minora, lateribus inflexis stamina amplectentibus. *Stamina* 6 (interdum 3), libera, petalis subæqualia, ad eorum unguem adnata, et andrœcio centrali imo affixa; *filamenta* subincurva, erecta, carnosula, apice incrassata, interdum antice hirsuta; *antheræ* conniventes, 2-lobæ, cordatæ, marginibus rima longitudinali utrinque hiantes. *Ovaria rudimentaria* apice andrœcii punctiformia.—*Fœm. Sepala et petala* ut in masc. *Stamina* sterilia 6 (vel 3), æqualia; *filamenta* tenuiora, erecta, petalis involuta, apice (ex antheris effœtis) 2-glandulosa. *Ovaria* 3, libera, sepalis interioribus opposita, gibba, dense hirsuta, gynæcio brevi hirsuto insita, 1-locularia, 1-ovulata; *stylus* brevis; *stigma* excentricum, subtrilobum, concavum, reflexum, glabrum. *Drupæ* 3, vel abortu pauciores, gibbose subglobosæ, vel transversim oblongæ, carnosæ, glabræ, siccæ rugulosæ; *putamen* osseum, subglobosum, vel oblongum, subcompressum, zona peripherica canaliculata circumdatum, loculo cyclice hippocrepiformi condylum circumcingente; *condylus* magnus, loculo excentricus, convexus, intus septulo perforato 2-cameratus, meatu lineari vel ovato extus utrinque transversim pertusus. *Semen* loculo conforme, fere annulare, intus subplanum et lateraliter compressum; *integumenta* tenuia, ad faciem ventralem *raphe* longitudinali signata, et hinc intra fissuram condyli insinuata; *embryo* intra *albumen* simplex inclusus, per totam longitudinem tenuissimus, fere annularis, pariter compresso-teres, *cotyledonibus* accumbentibus, *radicula* supera ad stylum spectante 4-plo longioribus.

*Frutices scandentes in Asia tropica et ejus insulis crescentes; folia elliptica, acuminata, pleraque glabra, 3-nervia, petiolata; in-*

florescentia supra-axillaris, paniculata, petiolo longior et folio brevior; flores minimi, velutini.

§ I. EULIMACIA. Flores hexandri.

1. *Limacia scandens*, Lour., Cochin. ii. 761;—ramulis glabris, striatis; foliis oblongis, imo rotundatis, vix cordatis, trinerviis, apice acuminatis, coriaceis, utrinque glabris, subtus subfuscis, nervis venisque prominentibus; petiolo tereti, apice incrassato; paniculis binis, supra-axillaribus, pubescentibus, petiolo duplo longioribus.—Cochin China, v. s. in herb. Mus. Brit. (Loureiro).

The leaves are about  $3\frac{3}{4}$  inches long,  $1\frac{1}{2}$  inch broad, on a petiole 7–9 lines long; the panicles spring from a point 4 lines above the origin of the petiole; they are about 1 inch long, with two or three branches 2–4 lines long, each bearing about three one-flowered pedicels 1 line long; the flower consists of three ovate, acute, bracteiform sepals, three intermediate ones twice their size, and three inner sepals somewhat larger, with valvate margins and a membranaceous apical appendage, all pilose outside, glabrous within, thick and subfleshy; six cuneate-oblong petals, obtusely rounded at the summit, with inflexed margins, each embracing a stamen which somewhat exceeds it in length; the filaments are gradually clavate, and the adnate, parallel, oblong anther-cells are extrorse.

2. *Limacia oblonga*, nob., Ann. Nat. Hist. ser. 2. vii. 43; Hook. & Th. Fl. Ind. i. 189;—Cocculus oblongus, Wall. Cat.;—ramulis striatis, ferrugineo tomentosis; foliis oblongis vel lanceolato-oblongis, apice attenuato-acutis et mucronato-cuspidatis, imo rotundatis vel acutioribus, 3–5-nerviis, nervis exterioribus mox evanidis et anastomosantibus, coriaceis, utrinque glabris, supra in costa nervisque sulcatis et puberulis, subtus opacis, nervis validis venisque reticulatis prominentibus, petioloque brevi ferrugineo-tomentosis; paniculis racemosis, remote supra-axillaribus, binis vel solitariis, folio dimidio vel quarto brevioribus; staminibus glabris; ovarii sericeis; drupis subglobosis, gibbosis, rugulosis.—Malacca, v. s. in herb. Soc. Linn., Hook., et Lindl.; Penang (Wall. Cat. 4963), Malacca (Griffiths).

Wallich describes this species as a small tree from the hills of Pulo-Penang. In Griffiths's specimens from the mainland (which must not be confounded with those of another species) the leaves are more acute at base, and are otherwise distinguished by their fewer and more distant nerves. The leaves are 5–8 inches long, 2– $4\frac{1}{2}$  inches broad, on a terete petiole  $\frac{3}{4}$ –1 inch long, some-

what thickened and rugose at the apex, and inserted on the blade at a considerable angle, a little within the margin. The ♂ racemose panicles are very slender, tomentose, 4–5 inches long, with very numerous alternate branchlets, 4–8 lines long, bearing several shortly pedicelled minute flowers; the three outer sepals are ovate and pubescent on both sides; the three inner sepals are larger, valvate in æstivation, pubescent outside, glabrous inside, with a few hairs at the apex: the six petals are small, ovate, glabrous, with inflected margins, embracing as many subextrorse stamens: the style is short; stigma oblique, reflected, glabrous, and hollow.

3. *Limacia velutina*, nob., *l. c.* 43; Hook. & Th. Fl. Ind. i. 189; —*Cocculus velutinus*, *Wall. Cat.*;—ramulis tomentosus; foliis aut obovatis imo obtusis, sive acutioribus et apice subito attenuatis, vel ovatis basi late cordatis apice rotundatis et late emarginatis mucronatis, valde coriaceis, 3–5-nerviis, nervis 2 intermediis extus ramosis, 2 externis margini proximis et parallelis, mox in marginem revolutum continuis, supra lucidis, reticulatis, glabris, venulis immersis tomentellis exceptis, subtus fulvo vel ferrugineo tomentosus, nervis venisque transversis prominentibus (junioribus minoribus undique sericeis); petiolo brevi, crasso, apice basique tumido, valde tomentoso: paniculis racemosis ♂ geminis, supra-axillaribus, petiolo sub brevioribus, tomentosus, paucifloris, vel in ramulis novellis elongato-cirrhiformibus aphyllis et terminalibus; floribus minimis, tomentosus; sepalis 3 exterioribus bracteiformibus, 3 intermediis extus pilosis, intus glabris, 3 interioribus majoribus, marginibus valvatis, utrinque pilosis; petalis 6, parvis, obovatis, marginibus subauriculatis inflexis; staminibus 6, filamentis intus hirsutis.—In Ind. orient., *v. s. in herb. Soc. Linn.*, ♂, Singapoor (*Wall. Cat.* 4970); *in herb. Hook.*, Moulmein (*Lobb.* 335); Singapoor (*Schomb.* 69); ins. Philipp. (*Cuming*, 2402); ♀ Mergui, Tenasserim (*Griffiths*, 832).

This is a well-marked species, notwithstanding the great difference in the size and shape of its leaves. It differs from all other species of the genus in its pilose stamens. Its larger leaves are subquadrately oval, very thick and coriaceous, 6 inches long,  $5\frac{1}{4}$  inches broad, on a petiole  $1\frac{1}{4}$  inch long, the tumid base of which is articulated on a cupular node in the branch; the younger leaves are  $3-4\frac{1}{4}$  inches long,  $1-2\frac{1}{2}$  inches broad, on a petiole 9 lines long. Two short, slender ♂ racemose panicles spring from a point 2 lines above the petiole; they are 6–12 lines long, with three short branches, each bearing three pedicellated flowers; the filaments are quite smooth behind, but in front are covered with long, nearly erect hairs. Lobb's specimen, above

quoted, must not be confounded with another from the same locality. The drupes are larger and more oblong than in the following species; the putamen, transversely cuneate-oblong, is 10 lines long, 7 lines broad, and 5 lines thick.

4. *Limacia distincta*, nob.;—ramulis ferrugineo vel ochraceo tomentosis; foliis lanceolatis, utrinque acuminatis, cuspidato-mucronatis, imo longe 3-nerviis, supra lucidis, glabris, reticulatis, subtus opacioribus, nervis venisque transversis prominentibus; petiolo tereti, ferrugineo tomentoso, apice subtumido: paniculis ♂ racemosis, 1–3, supra-axillaribus, tomentosis, petiolo triplo longioribus; ramis paucifloris: ♀ solitariis, paulo brevioribus.—Malacca, *v. s. in herb. Hook.*, ♂ (sub nom. *L. oblonga*), Mergui et Malacca (Griffiths); ♀ sine loco (Griffiths).

The leaves of this species are 5 inches long,  $1\frac{1}{2}$  inch broad; petiole 10 lines long. The ♂ peduncles are inserted on the stem at a distance of 3 lines above each petiole, and are 2–4 inches long; their three-flowered branchlets are 3 lines long. The ♀ panicles are 2 inches long, their branches 4 lines, each bearing 4–5 bracteated 1-flowered pedicels. The drupe is nearly globular, and much shorter than in the preceding species, being 6 lines in diameter, on a stipitate support 1 line long, at the base of which are two small abortive ovules. The putamen is nearly orbicular, 5 lines in diameter, and 4 lines thick; it has a large discoid convex condyle, which is perforated by a small transverse foramen on each side, opening into the two hollow chambers about which the cell of the seed is circumscribed. The seed is in form nearly annular, flattened on its dorsal and ventral sides; a portion of the integument in the middle of the ventral face, with the raphe attached, penetrates to a considerable depth into the septum that divides the two hollow chambers of the condyle. The embryo, which is nearly cyclical, is 12 lines long, uniformly  $\frac{3}{4}$  line broad,  $\frac{1}{2}$  line thick, its incumbent cotyledons being four times the length of the radicle, which points to the style in the upper horn of the cell.

5. *Limacia inornata*, nob.;—ramulis subflexuosis, teretibus, ferrugineo tomentosis; foliis elliptico-oblongis, acuminatis, mucronatis, imo trinerviis, utrinque glabris, reticulatis, subtus pallidioribus, costa media petioloque tenui ferrugineo-pubescentibus; racemis plurimis, supra-axillaribus, 3–4, fasciculatis, gracilibus, tomentosis, folio longioribus vel æquilongis; floribus minutis.—Singapore, *v. s. in herb. Hook.* ♂ (Lobb).

The leaves are  $2\frac{3}{4}$  inches long, 1 inch broad; the slender pe-

tiolate 9–11 lines long. Four to six long and very slender raceme-like panicles are inserted 3 lines above the petiole; they are  $2\frac{1}{2}$  inches long; their branches,  $\frac{5}{8}$  inch long, bear many short pedicels with solitary flowers, which are very minute, the sepals being externally pilose; the petals, with inflected sides, are fleshy and marked with numerous minute raised dots in longitudinal series.

§ II. STEREOCLEA. *Flores triandri.*

6. *Limacia triandra*, nob., Ann. Nat. Hist. ser. 2. vii. 43; Hook. & Th. Fl. Ind. i. 188;—*Menispermum triandrum*, Roxb. Fl. Ind. iii. 815;—*Cocculus triandrus*, Coleb. Linn. Trans. xiii. 64;—ramulis teretibus, glabris; foliis lanceolato-oblongis, apicem versus valde attenuatis et acuminatis, utrinque glabris et concoloribus, supra nitidis, imo trinerwiis et triplinerviis, nervis basalibus mox evanescentibus, nervis alteris supra medium utrinque 3 arcuatim nexis; petiolo tenui, limbo 5-plo brevior: racemis ♂ supra-axillaribus sæpius solitariis, puberulis, petiolo brevioribus aut paulo longioribus; pedicellis unifloris, alternis, imo bracteola lineari munitis.—In insulis Malayensibus, v. s. in herb. Soc. Linn. et aliorum, ex hort. bot. Calcut. cult. (Wall. Cat. 4962); in herb. Hook., Ind. orient. (Abel).

Roxburgh describes this species as a native of Pulo-Penang, cultivated in the Calcutta Botanic Garden, where Wallich's specimens were collected: in these the leaves are  $3\frac{1}{2}$ – $4\frac{1}{2}$  inches long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch broad, on a petiole 9 lines long: in Dr. Abel's specimen the leaves are  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches long,  $\frac{5}{8}$ – $1\frac{1}{4}$  inch broad, on a petiole 6–9 lines long. The racemes, one to three in each axil, are 6–10 lines long; the pedicels are 1 line long, the flowers of the same length, with nine sepals in three series, the two outer series being pubescent, minute, and bracteiform, the outermost smallest; the three inner sepals, with valvate æstivation, are ovate, acute, externally rugose, with ciliated margins; petals six, cuneate-oblong, two-thirds the length of the inner sepals, smooth, with ciliated margins laterally inflected, erect; stamens three, erect, connivent, with introrse anthers, the filaments, as long as the inner sepals, are thickened at the summit, and embraced by three alternate petals; and in the centre are seen the punctiform rudiments of ovaria.

7. *Limacia Amherstiana*, nob.;—*Cocculus Amherstianus*, DC. MS.;—ramulis striolatis, glabris; foliis oblongis, imo rotundatis et obsolete cordatis, e medio gradatim angustatis, apice acuminatis, canaliculatis et recurvis, marginibus valde

undulato-crenatis, coriaceis, utrinque glaberrimis, imo trinerviis et triplinerviis, nervis basalibus mox evanescentibus, nervis alteris utrinque 5-6 arcuatim nexis, subtus ferrugineo-pallidioribus et opacis; petiolo tenui, sub lente puberulo, imo apiceque tumidulo, limbo decuplo brevior: racemo ♂ supra-axillari, solitario, pubescente, petiolo duplo longiore; pedicellis alternis, 1-floris, bracteola lineari-acuta donatis; floribus minutis.—In Tenasserim, *v. s. in herb. DC.*, Amherst (Wall. 1476, non Cat.); *in herb. Soc. Linn.*, Amherst (Wall. Cat. 4959 c, non A aut B).

The terete branch is 1 line in diameter, with axils 3 inches apart; the leaves are  $3\frac{1}{2}$ –4 inches long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch broad, on a petiole 4–5 lines long; the raceme is 1 inch long, with approximate alternate pedicels  $1\frac{1}{2}$  line long, each with a minute bract at base, which sometimes is lengthened and linearly lanceolate, 3 lines long and  $\frac{1}{2}$  line broad; flowers about  $\frac{3}{4}$  line long, with nine sepals in three series, the three inner ones cuneately oval, more than twice the length of the others, subpuberulous outside, with ciliated margins; six cuneately oblong petals, two-thirds the length of the sepals, glabrous and submembranaceous; three stamens, the length of the inner sepals.

8. *Limacia Wallichiana*, nob.;—foliis oblongis, imo rotundatis, sursum gradatim paulo angustioribus, apice acutis et callos mucronatis, e basi 5-nerviis, nervis exterioribus mox evanescentibus, nervisque alteris utrinque 3 arcuatim nexis, marginibus planis cartilagineis revolutis, utrinque glabris, supra nitidis, reticulatis, subtus pallidioribus; petiolo tenui, limbo 5-plo brevior, apice brevissime tumidulo, striato, obsolete puberulo.—In Avæ regno, *v. s. in herb. DC.* (Wall. 1292, non Cat.); *in herb. Soc. Linn.*, Prome (Wall. Cat. 4959 B, non A nec C).

A species differing from the former in its much flatter and more obtuse leaves, with much longer petioles. Although the specimens are without flowers, I have placed it in this section, on account of its general resemblance to the preceding; the branches are more flexuose, the axils nearer, being from 1– $1\frac{1}{4}$  inch apart; the leaves are  $3\frac{1}{2}$ – $4\frac{1}{4}$  inches long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch broad, on a petiole 9 lines long.

## 20. MENISPERMUM.

This genus, formerly numerous in species, is now confined to two extratropical climbing plants, one of North-American, the other of North-Asian growth, both in latitudes beyond the pa-

rallel of 30°. The authors of the 'Flora Indica' state that the genus only differs from *Cocculus* in having twelve to eighteen stamens, instead of six, which opinion is sanctioned by the authors of the new 'Genera Plantarum' in saying "vix satis a *Cocculo* differt." Such an opinion must have been formed without their having examined the plants with sufficient attention. The general habit of *Menispermum*, its many-lobed, cordate, peltate (not palate) leaves, the form of its petals, and the variable number of its floral parts are quite at variance with *Cocculus*; and at the same time there is so wide a difference in the organization of its putamen and seed that the two genera cannot even remain in the same tribe. In *Menispermum* the very compressed putamen has a condyle in the form of two very thin, reniform, and closely parallel plates, round the edge of which the narrow and nearly annular cell is circumfluent, and this is externally marked by one dorsal and two lateral prominent terete rings, finely cre-nated across, and leaving corresponding impressions inside the cell: the albumen, which fills the cell, is therefore in the form of a narrow tricarinated ring; and it contains an almost filiform embryo, in which the slender cotyledons are about the length of the radicle, and not broader than it. In *Cocculus*, on the other hand, the putamen is much more globular, has no prominent lateral ridges, and only a small smooth dorsal carina; the condyle forms a large thick bony mass, round which the nearly annular broad cell, flattened on the ventral side, is circumscribed; and it is divided by a septum into two lateral chambers, each having an external aperture: the seed has the cyclical shape of the cell, and its embryo, imbedded in albumen, is formed of two transversely broad, foliaceous, incumbent cotyledons, of twice the length and four times the breadth of the terete radicle. Under such opposite conditions of structure, it is difficult to conceive how the idea of a close approximation of the two genera could have been entertained. The validity of *Menispermum* as a very distinct genus is unquestionable: as now restricted, it has been well defined by Prof. Asa Gray; but it is desirable to amplify its diagnosis in the following manner:—

**MENISPERMUM**, Tournef., Linn.—*Flores* dioici. *Masc. Sepala* 6 (interdum abortu 4), biserialia, exteriora minora, spathulato-oblonga, membranacea, concava, æstivatione imbricata. *Petala* numero varia, 6–9, obovata, unguiculata, concava, apice subcucullata, lateribus supra medium auriculatis et involutis. *Stamina* 12–18, interdum 24, centro pluriserialiter affixa: *filamenta* compresso-teretia; *antheræ* ovatæ, basifixæ, filamento latiores, 2-lobæ, lobis adnatis, margine longitudinaliter dehis-



centibus.—*Fœm.* *Sepala* et *petala* ut in masc., sed latiora et breviora. *Stamina* sterilia tot quot *petala*, et iis opposita, apice 2-glandulosa, imò gynæcii affixa. *Ovaria* 3, gibba, ovata, apice rostellata, *gynæcio* brevi cylindraceo suffulta; *stylus* subnullus; *stigma* excentricum, radiato-laciniatum. *Drupæ* 3, pisiformes, valde gibbæ, stigmatè basin versus approximatò notatæ; *putamen* reniformi-orbiculare, valde compressum, carinis 3 teretibus crenatis prominentibus subannularibus (1 dorsali, 2 lateralibus) signatum, 1-loculare, loculo lunato condylum circumcingente; *condylus* reniformi-laminiformis; *semen* 3-carinatum, loculo conforme; *integumenta* tenuissima, ventre laxa, et hinc per raphen in sulcum condyli profunde intrusa; *embryo* filiformi-teres, in *albumine* simplici fere annularis, *cotyledonibus* semiteretibus, incumbentibus, *radicula* supera ad stylum spectante paululo longioribus.

Frutices scandentes in America septentrionali et in Asia boreali vigentes; folia alterna, petiolata, sæpius peltata, orbicularia vel angulato-lobata, glabriuscula vel pubescentia; paniculæ supra-axillares, solitariae vel geminae, ad medium vel ultra medium nudæ, trichotome vel alternatim ramosæ aut umbellatæ.

1. *Menispermum Canadense*, Linn. sp. 1468; DC. Syst. i. 540, Prodr. i. 102; Lam. Dict. iv. 95, tab. 824; Bot. Mag. t. 1910; Torr. & Gray, Fl. N. Am. i. 47; A. Gray, Gen. U. St. i. 74, t. 29; Spach, Phaner. viii. 20, tab. 62. f. 2;—*Menispermum Smilacinum*, DC. l. c. 541;—*Cissampelos Smilacina*, Linn. 1473; Jacq. Coll. iv. 128; Icon. rar. iii. tab. 629;—ramulis teretibus, striatis, glabris; foliis peltatis, cordato-orbicularibus, sinuato-lobatis, lobis 3-5-7, lateralibus sæpius obtusis vel obsoletis, terminali subacuto et abrupte mucronato, membranaceis, utrinque glabris, 9-nerviis, reticulatis, supra læte viridibus, subtus cano-opacis; petiolo limbo subæquali, tenui, striato, divaricato; panicula ♂ supra-axillari, ad medium nuda, petiolo subæquilonga; ♀ pedunculo petiolo tertio breviorè, apice flores 1-3 fere sessiles gerente.—In America septentr., v. s. in herb. variis, e Canada, Tennessee, Florida, &c.

The above characters are common to all the specimens I have seen, extending from Florida to Canada, those of more southern growth being naturally larger and more luxuriant. The internodes are 4 inches long; the leaves  $3\frac{1}{2}$ -5 inches long,  $3\frac{3}{4}$ - $5\frac{1}{2}$  inches broad, on a petiole 3-4 inches long. The ♂ flowers have 6 sepals, 6 petals, 15-16-18 stamens; ♀ 6 sepals, 6 petals, 6 sterile stamens, and 3 ovaries; the putamen is  $3\frac{1}{2}$  lines in diam. The *Menispermum Smilacinum*, DC., seems to differ in having only 4 petals.

2. *Menispermum Dahuricum*, DC. Syst. i. 540; Prodr. i. 102; Deless. Icon. i. 26, tab. 100;—*M. Canadense*, var.  $\beta$ , *Lam. Dict.* iv. 95;—ramulis striatis, glabris; foliis peltatis, cordatis, late deltoideis, angulato-lobatis, lobis 5–7, acutis et mucronatis, 9-nerviis, reticulatis, membranaceis, supra nitidis, glabris, subtus pallidis, glabriusculis, in nervis breviter puberulis; petiolo limbo longiore, subtenui, glabro: racemis  $\sigma$  binis, axillaribus, petiolo dimidio brevioribus, pedunculo nudo, summo pedicellis plurimis unifloris subumbellatim capitellato.—In Asia septentr., *v. s. in herb. variis*, Irkutsk (Turczaninow); Dahuria (Fischer); China (*in herb. Lindl.*); *v. v. in hort. bot.* Kew cult. (sub nom. *M. Canadense*).

This plant will be seen to be very near the typical species, differing in its usually smaller and more distinctly lobed leaves, but chiefly in the character of its inflorescence and in the number of its floral parts. Its internodes are 1–1½ inch long, the leaves 1¼–3 inches long, 2¼–3 inches broad, petiole 1¾–2½ inches long; the peduncles of the  $\sigma$  racemes are slender, 1–2 inches long, supporting ten to twenty subumbellated pedicels 2 lines long, bracteated at base; flowers expanded, 2 lines in diam.; sepals six; petals six to nine; stamens twelve.

## 21. PERICAMPYLUS.

This genus was proposed by me in 1851 for a small group of East-Indian plants, the type of which is the *Cocculus incanus*, Coleb. It has been adopted by the authors of the 'Flora Indica,' who remark that "it has the fruit of *Cissampelos* or *Stephania*, with the flowers of the tribe *Cocculæ*; the 2-partite style and the peculiar inflorescence distinguish the genus." The authors of the new 'Genera Plantarum' go so far as to state that it is not sufficiently distinct from *Cocculus*. This opinion has evidently been formed under a complete misconception of its structure, as the facts here adduced will show: they would have been much nearer the truth if they had so contrasted it with *Menispermum*. *Pericampylus* differs from the latter genus in its nearly palatate leaves, in the isometrical number of its floral parts, in its larger spathulate sepals, in the large, fleshy, globose or clavate termination of the filaments, where they are suddenly bent back extrorsely at a right angle, and upon which the anther-cells are laterally imbedded, with a narrow and sometimes excurrent connective between them: it differs no less in its excentric style, with a bifid or twice-bifid stigma; in its putamen, which (although with a condyle like that of *Menispermum*) has the whole of its external ring covered by two or three lateral

and two dorsal concentric rows of tubercular spines, with transverse radiating grooves between the spines. *Pericampylus*, in the structure of its putamen and seed, differs as widely from *Cocculus* as *Menispermum* has been shown to be at variance with that genus—a difference which places *Cocculus* in a separate tribe. The inner surface of the cell of the putamen in *Pericampylus* and the external corresponding face of the seed are marked by broad radiating grooves, conformable with the spaces between the external spines; the embryo, as in *Menispermum*, is very long, uniformly very slender, quite different from the thick foliaceous cotyledons of *Cocculus*, where they are greatly broader than the short terete radicle.

**PERICAMPYLUS**, nob.—*Flores* dioici. *Masc.* *Sepala* 9, ternatim disposita, quorum 3 exteriora bracteiformia, minutissima, 3 interiora spatulato-oblonga, 3 intermedia paulo longiora, oblonga, extus pilosa, æstivatione imbricata. *Petala* 6, sepalis opposita, et 3-plo breviora, cuneato-ovata, apice subtruncata vel obsolete 3-loba, marginibus introflexis, ad andrœcium brevissimum unguibus affixa. *Stamina* 6, petalis amplexa, subbiserialia, erecta; *filamenta* omnino libera, andrœcio congregatim imposita, apice ample clavata, gibbosa, et subextrorsum reflexa; *antheræ* 2-lobæ, lobis compresso-globosis, connectivo angusto subexcurrente sejunctis, utrinque rima laterali hiantibus.—*Fœm.* *Sepala* 6, ut in masc. *Petala* 6, latiora, apice truncata lateribusque inflexa. *Stamina sterilia* 6, filiformia, apice vix glandulosa, petalis longiora, imo gynæcii affixa. *Ovaria* 3, valde gibbosa, ovata, gynæcio brevi 6-gono imposita, 1-locularia, 1-ovulata; *stylus* brevis, crassus, rostellatus; *stigma* lineare, subito deflexum, supra canaliculatum, ultra medium divaricato-bifidum vel bis bifidum. *Drupæ* 3, gibboso-ovata, transversæ, carnosæ, stylo persistente basi proximo notatæ; *putamen* osseum, suborbiculatum, compressum, peripheriam versus utrinque spinulis plurimis acutis vel truncatis in seriebus 2 vel 3 circa condylum concentricè dispositis echinatum, 1-loculare, loculo hipocrepico; *condylus* utrinque concavus et laminiformis, imperforatus; *semen* loculo conforme, radiatim sulcatum; *integumenta* tenuissima, ventre laxa, et hinc per *raphen* in sulcum condyli intrusa; *embryo* teres, gracilis, in *albumine* simplici cyclice arcuatus, *cotyledonibus* semiteretibus, incumbentibus, *radicula* supera ad stylum spectante paulo brevioribus.

Frutices *scandentes Asiae intertropicæ*; ramuli *teretes, retrorsum tomentosi*; folia *subrotunda, subcordata, pubescentia, 5–7-nervia, longiuscule petiolata, petiolo paulo intra marginem affixo*; inflorescentia *supra-axillaris, pubescens, paniculata, trichotome*

*divisa, ramis divaricatis iterumque compositis; flores breviter pedicellati, minimi, villosi.*

1. *Pericampylus incanus*, nob., Ann. Nat. Hist. 2 ser. vii. 40; Hook. & Th. Fl. Ind. i. 194 (in parte);—*Cocculus incanus*, *Coleb. Linn. Trans.* xiii. 57;—*Cocculus lanuginosus*, *Bl. ? Bijdr.* 24;—*Cocculus corymbosus*, *Bl. ? l. c.* 24;—*Cissampelos Mauritianana*, *Wall., in parte (non Pet. Th.)*;—*Menispermum villosum*, *Roxb. Fl. Ind.* iii. 812 (*non Lam.*);—ramulis terebintibus, retrorsum pubescentibus; foliis vix peltatis, late orbicularibus, imo subcordatis vel truncatis, apice acutis aut sæpius obtusis emarginatis et mucronatis, margine nervigero crenatis, 5–7-nerviis, nervis rectiusculis et eorum ramis externis in sinus crenellarum lapsis, supra glabriusculis et in nervis puberulis, pallidulis, subtus cano vel flavido tomentosis; petiolo limbo paulo vel dimidio brevioribus; paniculis ♂ axillaribus, binis, vel pluribus fasciculatis, pedunculo petiolo æquilongo, apice umbellatim ramoso; floribus minutis, valde corymbosis; sepalis extus pilosis, petalis brevioribus, cuneato-ovatis, apice truncatis, lateribus inflexis, filamentis apice extrorsum geniculatis, antheris hinc horizontaliter dehiscentibus: paniculis ♀ binis, petiolo æquilongis, vel dimidio brevioribus; stylo erecto, subito geniculato et reflexo, stigmate bifido, laciniis elongatis, divaricatis; putamine in forma hippocrepica utrinque biserialim tuberculato.—In Asia intertropica, *v. s. in herb. Soc. Linn.* ♂ et ♀, Chittagong et Penang (*Wall. Cat.* 4980 A, a (non b), c, e (non B, D), 4981 B (non A); *in herb. Mus. Brit. et Hook.*, Chittagong (Roxburgh), Java (Horsfield, Zollinger, 481), India (Abel), Malacca (Griffiths), Assam (Griffiths, 354).

There is probably more than one species included in the above enumeration; and in the herbarium of Dr. Lindley there is a specimen from Malacca, collected by Griffiths, with thicker and more velvety leaves, with short axillary ♀ panicles, and a putamen with three concentric rows of very short acute spines, different from the type. The specimens from Java are perhaps specifically distinct, but I have included them here, as well as another from Borneo. The authors of the 'Flora Indica' have absorbed in this (the only species they acknowledge in the genus), and Mr. Bentham has done the same in his 'Flora Australiensis,' i. 58, a plant from Australia which is extremely different, not only in a specific but in a generic point of view: it is the *Cocculus Moorii* of Dr. Mueller, which I have elsewhere described as the type of a distinct genus, under the name of *Legnophora*.

The leaves in this species vary much in size and shape: some are nearly orbicular, cordate at base, or they become more acute

toward the summit, and are more deltoid, while others are truncated at base; they are from  $1\frac{3}{4}$ –3 inches long,  $2\frac{1}{2}$ – $3\frac{1}{4}$  inches broad, on a petiole  $1$ – $1\frac{1}{2}$  inch long. From two to six ♂ panicles are fasciculated in each axil, supported upon bare peduncles about the length of the petiole, each emitting at its summit three to six umbellate branches, which are dichotomously divided and furnished with numerous very small corymbose flowers; the sepals are membranaceous, spathulately oblong, pilose outside; the six petals are opposite to them, cuneately obovate, truncated at the summit, with inflected sides which embrace the filaments; they are about half the length of the sepals, and shorter than the stamens; the filaments are quite free, erect, thickened towards the apex, where they are suddenly bent outwards, the anthers are globose subdidymous, partly imbedded in the filament, somewhat extrorse, each lobe opening by a horizontal fissure. The ♀ panicles do not exceed two in number, are shorter, less spreading, with much fewer flowers; the sepals and petals are similar, the filaments anantherous; the three ovaries, seated upon a short receptacle, face the three narrower sepals; the style is short, suddenly reflected horizontally, and is deeply cleft into two divaricating slender stigmata obtuse at the extremity, all perfectly glabrous; the putamen is obovate, much compressed, truncated at base, with a hippocrepical cell, forming a broad raised border, circumscribed round the concave discoid condyle; this border, on each side, is marked by a number of incurved radiating scutcheons separated by as many shallow grooves and terminated at each extremity by obtuse tubercles, thus forming two hippocrepical rows of raised tubercles, one peripheral, the other making a raised rim round the condyle.

2. *Pericampylus aduncus*, nob.;—*P. incanus*, *Hook. & Th., in parte, Fl. Ind.* i. 194;—ramulis teretibus, retrorsum pubescentibus, subflexuosis; foliis vix peltatis, deltoideo-orbicularibus vel deltoideo-ovatis, basi in sinum latissimum fere truncatis, obtusis, aut subcordatis, e medio summum versus angustatis, sæpius attenuatis, apice raro obtusis, sæpissime valde acutis et longe mucronatis, 5–7-nerviis, submembranaceis, valde reticulatis, marginibus integris nervulo incrassatis, supra subnitentibus, glabris, aut in nervis subpuberulis, subtus thalassino-glaucis, et in nervis tenuibus prominulis pubescentibus; petiolo tenui, tomentello, limbo æquilongo: paniculis ♂ axillaribus, pluribus fasciculatis, petiolo subbrevioribus, alternatim ramosis, floribus sparsis pedicellatis, vel inflorescentia e ramulo novello aphylo racemum elongatum simulante, axillis cymulas, ramosas gerentibus; sepalis 3 exterioribus lineari-oblongis, 3 alternis obovatis; petalis glabris, paulo

brevioribus, cuneato-oblongis, 3-lobis, lobo apicali rostrato, lateribus inflexis; filamentis complanatis, apice rectis; antheris verticalibus, hinc longitudinaliter dehiscentibus: paniculis ♀ axillaribus, sæpius solitariis, petiolo longioribus, longe ramosis, ramis valde divaricatis iterumque divisis; sepalis cuneato-ovatis, apice obtuse apiculatis; stylo crassiusculo, brevissime et subito geniculato; stigmatibus 2, brevissimis, acutis, divaricatis; putamine ad peripheriam seriebus 2 approximatis spinarum cristato, et utramque faciem circa condylum crista hippocrepica erecta spinosa armato.—In montibus Himalayensibus, *v. s. in herb. Hook.* ♂, Darjeeling (Griffiths); ♂ et ♀, Sikkim (Hook. & Th.), Assam (Jenkins); *in herb. Soc. Linn. Sylhet* (Wall. Cat. 4980 D in parte).

This species is distinguished by its generally larger, acute, cuspidate, and almost acuminate leaves, their much longer and more slender petiole, a dissimilar inflorescence, differently shaped petals, shorter stamens, with straight filaments, so that the anthers maintain an erect position, a style with a very abbreviated inflexion, and very short acute stigmata, a putamen with cristate rows of longer spines, instead of tubercles. I have included in this species the specimens from Assam and Sylhet, notwithstanding that their leaves are smaller, more elongated, of thinner texture, and of a paler colour, and also a somewhat different inflorescence; but they agree with the Khasya plants in many of those particulars which distinguish them from the typical species. In the Khasya specimens the leaves are 3–4½ inches long, 3¼–4¾ inches broad, rarely with a basal sinus 2 lines deep, generally truncated at base, on a petiole 2¼–4 inches long. In the Assam plants they are 2¼–4 inches long, 1¾–3¼ inches broad, extremely acute at summit, often somewhat rounded at base, sometimes subcordate, with a basal sinus 1 line deep, on a slender petiole 1–1¾ inch long, and in all cases the petiole is inserted ½ line within the margin of the blade. The axillary ♂ panicles are 1½ inch long, but in some of the Khasya specimens we find in each axil an aphyllous raceme-like inflorescence, 7 inches long, with branches ½ inch apart, the lower branches being 2½ inches long, diminishing upwards to ½ inch in length; these axils emit sometimes only one, often four or five fasciculated branches, which are alternately and shortly ramified, each ultimate branchlet bearing about three very small flowers, remarkable for the peculiar shape of their petals. The ♀ panicle, generally solitary, is about 4½ inches long; the peduncle is bare for the length of 2 inches, at which distance it emits two unequal branches, the longer one measuring 2 inches; other axils succeed at intervals of about ½ inch, each with two unequal branches varying from

$\frac{1}{2}$  to 1 inch in length; these bear alternate branchlets, each with four to six alternate pedicellated flowers. This panicle in fructification lengthens and spreads considerably; and as many of the shorter branches wither it assumes the appearance of a lax divaricated dichotomously divided panicular raceme, bearing numerous drupes, about the size of a pea, at the extremities of the numerous ramifications. The putamen is easily distinguished from that of the preceding species by being larger, suborbicular, 3 lines in diameter, truncated at base; on the periphery there is a double row of centrifugally erect spines, and standing out at a right angle with them is another row of acute erect spines, and an inner tubercular hippocrepial ridge which forms the margin of a large, very concave, discoid condyle, thus much resembling the putamen of *Menispermum*.

The plant in Wallich's collection from Sylhet resembles those from Assam, and bears much similarity in external appearance to *Pselium ambiguum*: the latter has petals with a terminal rostrated lobe, as in the species under consideration; but its stamens are united in a central column, while they are quite free in this as in other species of *Pericampylus*. There remains, therefore, only the monadelphous feature of the stamens to distinguish the two genera, which, it must be confessed, is not a very strong character.

3. *Pericampylus Assamicus*, nob.;—ramulis contortis, teretibus, striatis, glabris, junioribus flavido tomentosus; foliis quasi palatis, deltoideo-rotundatis, imo cordatis, e medio sensim acutis, mucronatis, 7-nerviis, supra fusco tomentosus, nervis flavidis, subtus dense cinereo vel flavido tomentosus, margine ciliato; petiolo subtenui, flavido tomentoso, limbo 4-plo brevioris: paniculis ♂ axillaribus, plurimis fasciculatis, folio brevioribus, inter se crebre implexis; pedunculis subbrevibus, validiusculis ramisque dense flavido pilosis; sepalis extus pilosis, pallide membranaceis; petalis brevioribus, glabris, cuneato-ovatis, apice rotundiusculis, lateribus inflexis; staminibus erectis, liberis, quorum 3 paulo breviora; filamentis apice vix incrassatis, extus inflexis; antheris extrorsis, hinc horizontaliter dehiscentibus.—In regno Assamico, *v. s. in herb. Mus. Brit.*, Assam (Griffiths, 568).

This is very different in its general aspect from the two preceding species, which are also found in the same region; here, however, the leaves are palate (not peltate), smaller, very cordate, acute, with very entire margins, densely clothed beneath with short yellow tomentum; they have shorter and thicker petioles: it differs more especially in its extremely abundant, shortly-branched, broad, interwoven panicles, thus forming a dense accumulation of very minute flowers. The leaves are  $1\frac{3}{4}$ –2 inches

long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch broad, with a rather acute basal sinus 2 lines deep, the petiole being only  $\frac{1}{2}$  inch long. The ♂ panicles, which are very numerous in each axil, are about  $1\frac{3}{4}$  inch long, widely spread upon a peduncle 4 lines long, which branches repeatedly at short intervals, its form being quite lost in the complexity of the whole inflorescence.

4. *Pericampylus membranaceus*, nob. ;—*Cocculus membranaceus*, Wall. Cat. ;—ramulis scandentibus, teretibus, teneribus ; foliis obsolete peltatis, deltoideo-ovatis, imo rotundis vel subsinuatis, apice rotundiusculis, longe mucronatis, valde membranaceis, 5-nerviis, cum nervulis 2 alteris basalibus mox in marginem continuis, utrinque fere glabris, in nervis solummodo parce puberulis, margine ciliatis ; petiolo tenuissimo, striolato, retrorsum puberulo, limbo dimidio brevior.—In Malacca, v. s. in herb. Soc. Linn., Pulo-Penang (Wall. Cat. 4967).

Many specimens of this plant have been distributed from the Wallichian collection ; but in no instance has the trace of inflorescence been detected, probably owing to the time of year when the plants were collected. The authors of the 'Flora Indica' consider it to be a diseased state of their *Cissampelos Pareira* (*C. convolvulacea*, DC.) ; but here, I think, they are under misconception, because its leaves have the peculiar nervation of *Pericampylus*, in which genus the nerves and their external branches do not anastomose as in *Cissampelos*, but are directed towards the edge of the leaf in a straight line, there uniting with a distinct marginal nerve, and each generally terminating in the sinus of a crenature. It might be regarded as *Pericampylus incanus* in a sickly condition ; but the shape of its leaves hardly supports this supposition : it will most probably turn out to be a distinct species. The branches are extremely slender, with very crowded foliage, the smaller leaves being almost palme, and seldom more than  $\frac{1}{2}$  to  $\frac{3}{4}$  inch in diameter ; the larger leaves are few, 2 inches long, 2 inches broad, on a very slender petiole 1 inch long, inserted half a line within the margin.

## 22. PSELIMUM.

In 1851 I formed the character of this genus from the examination of Loureiro's typical specimen in the British Museum, which has only male flowers. That botanist, however, was wrong in his generic details, as it is evident that the plant from which he derived the character of the female flower and seed must have been a *Stephania* : in his description of the male flower, he is incorrect in stating that its six petals are twice the length of



the six sepals. The authors of the 'Flora Indica' declare that Loureiro's specimen above mentioned is clearly identical with *Pericampylus incanus*. As far as regards the leaves, I admit that there is much resemblance, but not so in the character of the inflorescence, its very short panicle being very different from the widely spread umbellate inflorescence of *Pericampylus incanus*; its sepals are pilose on both sides, its petals being only one-fifth of their length; the stamens are confluent for more than half their length in a monadelphous column, the union of the three more central being continued to nearly their summit; the filaments are not clavate at the apex; and the anthers are differently constructed. If the union of the stamens had been continued up to the anthers, Loureiro's specimen would not have differed from a *Stephania*; and had they been disunited to the base, it would have been a *Pericampylus*. Under these circumstances, although I confess the difference is small, I should not be justified in abolishing Loureiro's genus. In many other genera of the family a similar feature gives one of their chief distinctive characters: in the union of three of its six filaments into a central column we have a parallel in *Cosciniun*; in *Trichlisia*, its six stamens are combined together for half or a third of their length; while in *Detandra* and *Syrrhonema*, each with only three stamens, these are united together for more than half their length.

*PSELIUM*, Lour.—*Flores* dioici. *Masc.* *Sepala* 6, spathulato-oblonga, basi longe unguiculata, 2-serialia, 3 exteriora paulo minora, utrinque pilosa. *Petala* 6, glabra, sepalis quinto breviora, spathulato-oblonga, lateribus inflexis, subauriculatis, summo incurvata. *Stamina* 6, æqualia; *filamenta* teretia, ultra medium in columnam centram monadelpham coalita, 3 interiora fere ad apicem conjuncta; *antheræ* subglobosæ, subquadrilobæ, subextrorsum apicifixæ, utrinque rima transversali dehiscentes.—*Fl. fœm.* ignoti.

*Frutex scandens, Cochinchinensis, pubescens; folia reniformia, 5-nervia; petiolus tenuis; paniculæ binæ, supra-axillares, petiolo multo breviores.*

*Pselium ambiguum*, nob.;—*Pselium heterophyllum*, Lour. *Coch.* ii. 762;—ramulis tenuibus, pubescentibus; foliis reniformi-orbicularibus vel subdeltoideis, imo vix cordatis, apice rotundatis, emarginatis et mucronatis, 5-nerviis, supra parce puberulis, subtus pallidis, sublucidis, puberulis; petiolo limbo dimidio brevioribus; paniculis binis vel ternis, axillaribus, petiolo brevioribus.—*Cochinchina, v. s. in herb. Mus. Brit.* (Loureiro).

The plant has greatly the habit and general appearance of

*Pericampylus incanus*; but its leaves are not crenated on the margins, its inflorescence is much shorter and not so dilated or so frequently umbellate. The leaves are  $1\frac{1}{4}$ –2 inches long,  $1\frac{3}{4}$ – $2\frac{1}{2}$  inches broad, on a petiole  $\frac{3}{4}$ – $1\frac{1}{4}$  inch long. The inflorescence scarcely exceeds 5 or 7 lines in length, on a peduncle shortly branched, the branches terminated by several minute pedicelated flowers, aggregated in a short corymbose head.

### 23. ILEOCARPUS.

This genus was proposed by me in 1851 for a plant in Schimper's Abyssinian collection: it is allied to *Pericampylus* and *Menispermum* on account of its putamen and seed, and approaches the following genus, *Homocnemia*. It differs, however, from *Menispermum* in its isomerous stamens, and from *Pericampylus* in its peltate leaves, in having only three membranaceous sepals, three smaller alternate petals, and a single ovary, with a short thick style and a somewhat erect stigma. *Homocnemia* differs from it in its tetramerous arrangement, having four sepals, four minute petals, and one compressed ovary on a disk-shaped support, and an obsoletely 2-lobed stigma. The authors of the 'Flora Indica' and of the new 'Genera Plantarum' unite this genus with *Stephania*, and consider that the typical plant is not distinguishable from *Stephania hernandifolia*. But *Ileocarpus* cannot well be reconciled with *Stephania*, on account of the absence of the perforation in the condyle, the presence of which is a universal feature in every species of that genus that I have seen. It cannot be denied that the plant in question has peltate leaves, and a habit like that of *Stephania*; but not more so than are found in *Cyclea*, *Clypea*, and many species of *Cissampelos*; the latter and *Clypea* are indeed the only genera among the whole group that harmonize with *Ileocarpus* in the structure of the putamen; the latter genus differs from all the rest in the shortness of its cotyledons compared with the length of the radicle.

ILEOCARPUS, nob.—*Flores* dioici. *Masc.* *Sepala* 6, biseriata, exteriora vix angustiora, oblonga, valde membranacea, glabra. *Petala* 3, suborbicularia, dimidio breviora, submembranacea. *Stamen* centrale; *filamentum* breve; *anthera* peltata, 6-loba.—*Fœm.* *Sepala* 6, quorum 3 exteriora glandulæformia rarius expansiora, 3 interiora obovata, membranacea. *Petala* 3, alterna, rotundata, imo unguiculata, sepalis dimidio breviora. *Stamina* nulla. *Ovarium* unicum, oblongo-ovatum, glabrum, gynæcio brevi insitum, 1-loculare, *ovulo* unico e facie ventrali appenso; *stylus* brevissimus, crassiusculus; *stigma* 3-fidum,

lobis brevibus, teretibus, suberectis. *Drupa* transversim ovata, carnosa, styli vestigio ad hilum proximo notata; *putamen* obovatum, compressum, peripheriam versus utrinque liris 7 brevibus 2-tuberculatis radiatim dispositis muricatum, 1-loculare, loculo hippocrepiformi circa condylum gyrato; *condylus* ovatus, laminiiformis, utrinque concavus et imperforatus. *Semen* valde compressum, hippocrepiforme, extus utrinque radiatim sulcatum; *integumenta* membranacea, margine ventrali laxa, hinc crassiora, et cum *funiculo* filiformi rigido intra fissuram condyli intrusa; *embryo* in *albumine* simplici, carnosus, teres, tenuiter elongatus, hippocrepiformis, *cotyledonibus* semiteretibus, incumbentibus, *radicula* æquilata, iis 3-plo longiore, ad stigma spectante.

*Frutex scandens Abyssinicus*; folia *integra, peltata, deltoideo-ovata, glabra, 10-nervia, petiolata*; panicula *supra-axillaris, umbellata*; pedunculus *tenuiter filiformis, glaber, apice bracteatus et floribus plurimis capitato-corymbulosis munitus*; flores *minuti, glaberrimi*.

*Ileocarpus Schimperii*, nob., Ann. Nat. Hist. ser. 2. vii. 40;—*Menispermum* (Cocculus) Schimperii, *Hochst. MS.*;—*Clypea Abyssinica*, *Dill. et A. Rich. Tent. Fl. Abyss.* i. 9, tab. 4; *Ann. Sc. Nat.* xiv. 263;—*Stephania Abyssinica*, *Walp. Rep.* i. 96; *Ann.* ii. 21;—subscandens; ramulis striatis, glaucis, lævibus; foliis profunde peltatis, deltoideo-ovatis, imo truncatis vel rotundatis, apice obtusis et mucronatis, 10–11-nerviis, utrinque glaberrimis, supra pallidis, opacis, reticulatis, subtus cano-glaucis, nervis venisque reticulatis prominulis, nervulo marginali tenuiter cartilagineo; petiolo tenuissimo, limbo subbreviore, glabro: panicula ♂ supra-axillari, umbellata, glabra; pedunculo tenui, nudo, petiolo dimidio breviore, umbellis 6 dimidio brevioribus iterum umbellulatis bracteisque 3 lanceolato-linearibus munito, umbellulis 6 imo 2-bracteatis, singulis 3-radiatis, radius pedicellos 3 alternos longiusculos ebracteolatos 1-floros gerentibus; floribus hinc corymbulosis; petalis glabris, membranaceis: panicula ♀ simillima, umbellis 4–5, singulis supra basin bractea lineari pedicellisque 3–5 alternis longiusculis ebracteolatis 1-floris munitis; drupis glabris.—In Abyssinia, *v. s. in herb. plurimis*, Adowa (Schimper, 178); *in herb. Hook.* ♀, Adowa (Dillon, 244); ♂, Oujerate (Plowden); ♂ & ♀, Ankober (Rohr. 151).

Since my former description of *Ileocarpus*, fifteen months ago (Ann. Nat. Hist. ser. 3. xiv. 372), I have seen a typical specimen of Dillon's *Clypea Abyssinica*, which does not differ specifically from Hochstetter's plant, the original type of the genus: both these, however, are female and fructiferous specimens. I have

also met with male plants of the same species, collected in distant places in Abyssinia, which now enable me to complete both the generic and specific characters of *Ileocarpus Schimperii*. In all the fructiferous specimens the putamen exhibits an imperforate condyle—a feature which maintains the validity of *Ileocarpus* as distinct from *Stephania*, where the condyle is invariably perforated. In Schimper's specimens the leaves are much larger, somewhat less orbicular, and the inflorescence is longer; the leaves are 3 inches long,  $2\frac{3}{4}$  inches broad, on a slender petiole  $2-2\frac{1}{2}$  inches long, which is tortuous and somewhat incrassated at its base, and inserted 8 lines within the truncated margin: the ♀ peduncle is  $1\frac{1}{4}$  inch long, its umbels 6 lines, the fructiferous pedicels 2 lines long; besides the bracteoles at its apex, each peduncle is there furnished with a small peltate leaflet, 4 lines long, on a petiolule 3 lines long; the putamen is 3 lines long,  $2\frac{3}{4}$  lines broad. In the other specimens the leaves are  $2-2\frac{1}{2}$  inches long,  $1\frac{3}{4}-2\frac{1}{4}$  inches broad, on a petiole 1–2 inches long, inserted 5–7 lines within the basal margin; both in the ♂ and ♀ the peduncle is 6–10 lines long, the umbels 4–5 lines long, the pedicels 1 line, and the sepals of equal length; in both sexes the latter are membranaceous and quite glabrous.

#### 24. HOMOCNEMIA.

This genus, originally proposed by me in 1851, was founded upon a plant in Drège's South-African collection, named by Dr. Meyer *Cissampelos umbellata*. The female flower only is known, which differs from *Ileocardus* and *Stephania* in having four sepals, four petals, and an ovary with an obsoletely bifid stigma. The authors of the 'Flora Indica' and the new 'Genera Plantarum' make this genus and *Ileocarpus* identical with *Stephania*; but it differs from *Stephania* in the number of its floral parts, in the shape of its ovary and stigma, and in the peculiar involucre development of its extremely short umbels; it is, indeed, nearer to *Chysea*, but sufficiently distinct from either, as the following diagnosis will show:—

HOMOCNEMIA, nob.—*Flores* dioici. *Masc.* ignoti.—*Fœm.* *Sepala* 4, ovata, extus pilosa, per paria opposita, æstivatione imbricata. *Petala* 4, sepalis 3-plo breviora, rotundata, carnosâ. *Stamina* nulla. *Ovarium* solitarium, ovatum, breviter stipitatum, compressum, rectum, glabrum, sulco longitudinali latere notatum, 1-loculare, *ovulo* e pariete ventrali appenso; *stylus* brevissimus, apice obtuso emarginatus, intus stigmatosus. *Cætera* ignota.

Suffrutex *Capensis volubilis*; folia alterna, peltata, longe petiolata; paniculæ geminæ vel solitariae, axillares, petiolo breviores, pedunculo composite umbellato, umbellis involucreatis, umbellulis bracteatis, apice flores 4 sessiles gerentibus; flores minimi, 1-bracteolati.

*Homocnemia Meyeriana*, nob. ;—Cissampelos umbellata, *E. Mey.*; —scandens; ramulis angulatis, tomentosis; foliis peltatis, orbiculari-ovatis, imo rotundatis, concavis, 12-nerviis, supra subglabris, subtus ferrugineo tomentosis, reticulatis; petiolo limbo dimidio brevior, tomentosus; pedunculis binis vel solitariis, axillaribus, tomentosis, petiolo subbrevioribus, umbellis 3-4, bracteis totidem cuneato-obovatis, æquilongis, adpressis, involucreatis; umbellulis 3-4, bracteolis munitis, flores 2-4 sessiles gerentibus; floribus 1-bracteolatis; sepalis extus lanato-tomentosis, intus glabris; petalis ovarioque glabris. —In colonia Capensi, *v. s. in herb. Hook.* (Drège).

This plant has a very peculiar appearance, its branches, the underside of its leaves, the petioles, and inflorescence being densely clothed with soft tomentum; the internodes are  $1\frac{1}{2}$  inch long; the leaves  $3\frac{1}{2}$ -4 inches long,  $3\frac{1}{2}$  inches broad, on a stout deflected petiole  $2\frac{1}{4}$  inches long, inserted 1 inch within the basal margin; the peduncle is  $1-1\frac{1}{2}$  inch long, the umbels 2 lines long, with erect, adpressed, ovate bracts of equal length; the umbellules  $\frac{1}{2}$  line long, each bearing on their apex two to four sessile, very minute flowers.

Since I first saw this plant in the Hookerian herbarium, two specimens, ♂ and ♀, of a very different species, and belonging to another genus, have been glued upon the same sheet, as being identical with it; these are from Natal, and will be described under *Clypea*.

## 25. CISSAMPELOS.

This extensive and cosmopolitan genus is one of the oldest of the *Menispermaceæ*. The plants, for the most part, are slender climbers, with woody branches; but among the South American species there are several low shrubs with erect stems, scarcely more than 1 or 2 feet high, covered with imbricated leaves. The leaves seldom exceed a mediocre size, and are sometimes small; they are generally more or less orbicular, often reniformly cordate, and are either peltate or palmate, rarely quite glabrous, with petioles either elongated or very short. The male inflorescence is usually in slender axillary panicles, variously divided, often 3 or 4 fasciculated in each axil, where they are frequently accompanied by an elongated raceme with alternate axils, each bearing similar, but

much shorter, fasciculated panicles, and bare of leaves, or having only a minute bract in their place : this raceme-like development is, properly speaking, a young floriferous branch with abortive leaves, as is proved by the frequent presence of regular leaves diminishing gradually to the size of minute bracts. The female raceme is elongated, generally solitary, or geminate in each axil, with a number of approximated large orbicular bracts (appearing like young leaves as they really are), each bearing in its axil from three to ten fasciculated pedicellated flowers ; sometimes, however, these leaflets are wanting, when their place is supplied by diminutive bracteoles. The male flowers, always minute in size, consist of four, rarely five or six, oblong sepals, a single cup-shaped petal, and a single stamen in the centre, with its anther usually 4-lobed, or where the lobes are constricted and 2-celled it appears 8-lobed, or by suppression of some of them 5-6-lobed, all the lobes fixed on the margin of a peltiform connective supported on a short slender filament. The female flower, also minute in size, has only one oblong sepal, with a shorter petal attached to its claw, both fixed extrorsely at the base of a solitary ovary, which grows into a small fleshy drupe. The species are numerous and often difficult to determine ; for, owing to the extreme simplicity of the floral parts and their minute size, they afford few discriminating characters ; the principal differential features therefore rest chiefly on the habit of the plant, on the form of the leaves, the comparative length of the petiole, the point of its insertion, and on the inflorescence : these offer many good and constant characters.

The authors of the 'Flora Indica' (p. 200), in their attempt to determine the Indian species of *Cissampelos*, came to the extraordinary conclusion that all the Asiatic, most of the African, and nearly all those belonging to the New World constitute one single species, and they fix upon *Cissampelos Pareira* of Linnæus, a native of the Antilles, as the representative of this common type. In their view it does not signify whether the leaves be deeply or only slightly peltate, or whether the petiole be inserted on the margin of the blade—whether they be cordate, or otherwise ; let them be acute, round, or elongated, whether upon very long petioles or nearly sessile, however various be the form or extent of the inflorescence, whether bracts be present or absent—all these differences, which are regarded as of great specific importance by botanists in general, are of no value whatever in their consideration. Such an unprecedented annihilation of about fifty dissimilar kinds of *Cissampelos*, which have long been recognized in various botanical works, and to which distinct characters have been assigned, ought to be viewed with distrust, in the absence of good reasons ; a repudiation of such vast extent, even on the part of botanists of deservedly high repute, will induce most botanists

to pause before they assent to so sweeping a conclusion, and must diminish the reliance that would otherwise be placed in the value of their decisions where, as I have shown, they have endeavoured to nullify not only good species, but valid genera. Messrs. Bentham and Hooker, in their 'Genera Plantarum,' do not go quite the length of the authors of the 'Flora Indica' in regard to *Cissampelos*; but, as might be expected, they indorse their decision to a great extent; for they recognize only twelve species as belonging to tropical America, five African (including those of *Antizoma* in the number), and only another solitary species, which, according to their view, is widely distributed over the rest of the world, and known to botanists under names which they regard only as synonyms of *Cissampelos Pareira*. However convenient this method may be for the easy determination and laconic description of plants, it tends to force back the science of botany to the state in which it existed in the time of Linnæus, when it was ruled that any diversified number of plants which responded to a short diagnosis comprised within twelve words should be held to form a single species. If this method were again adopted, as now attempted in *Cissampelos*, it would nullify the great aim of modern botanists, who seek for the greatest number of differential characters in the determination of each individual; and it would restrict us to the employment of two or three leading features, in the discrimination of a species, that might perhaps be common to a great many different kinds.

Nothing in the shape of sustainable evidence has been offered to prove that the fifty or more described species of this genus are descended from *Cissampelos Pareira*; it is not an inference drawn from facts, but an assumption in direct contradiction to all the simple truths which nature discloses. Nevertheless, suppose we grant for an instant that, in an immeasurable course of time, and under the influence of "natural selection," the imagined type has undergone the modifications and preserved the varieties of form now exhibited, the inference to be drawn from this admission is, that, if such modifications be now permanent, each confined within a limited range of distribution, and we can assign to them severally constant and determinable characters, then clearly, according to the rules of science, they ought to be considered distinct and valid species. In determining different kinds of plants the practical botanist should not be guided by any theory of the distant "origin of species," but should regard them in their present forms. Under this conviction I have opposed the doctrine in question, and have diligently attempted to fix certain characters to nearly seventy species of *Cissampelos*. The specific characters I shall give are long, but not longer than is necessary in the first instance to particularize each species; for it

must not be forgotten that this preliminary labour is chiefly intended to collect the materials for future monographers of this difficult family. It is not unlikely that I may have erred in some instances, especially where the loan of specimens to compare with others has been impossible; the only plan within my reach has been to make careful tracings of every specimen in the different herbaria accessible to me, marking each feature, examining the flowers, and preserving drawings of their analyses: by this method the elaboration of *Cissampelos* alone has demanded more than twelve months of continued investigation. In vindication of those botanists who have renounced in utter despair a task like this, it is right to mention the hopeless confusion that exists in all herbaria that I have seen, especially among Asiatic plants of this genus. Specimens of the same species are there referred to different names and numbers, or the same names and numbers are given to dissimilar plants; and different species, sometimes with plants of other genera, are fixed on the same sheet as being identical; in short, an almost inextricable perplexity exists. In addition to this, the want of good typical specimens and the imperfect short diagnoses on record have rendered it difficult to recognize any plant with precision; so that when a predisposition has existed to annihilate existing species, the opportunity has been very favourable for that purpose. I confess that I have often been disheartened by this perplexity; and it has only been by renewed exertion and a large amount of patience that I have been able to arrive at the conclusions now brought together.

In this issue, I regret to find myself at variance with botanists of the highest repute, whose opinions, from the extent of their labours and the amount of their knowledge, deservedly command universal respect; but, after many years of study, I cannot renounce the strong belief that the very extreme views they have entertained, not only in regard to *Cissampelos*, but to other genera of the *Menispermaceæ*, cannot hold ground against the body of evidence I have been able to bring together.

It is to be deeply regretted that, in a work of such great importance as the 'Flora Brasiliæ' of Prof. von Martius, Dr. Eichler, the erudite author of the monograph upon Brazilian *Menispermaceæ*, should have been so fascinated by the extreme views of the learned authors of the 'Flora Indica' and the 'Genera Plantarum' as to have followed their example. I cannot believe that a botanist of such acknowledged merit would have adopted this course if he had carefully worked out his materials. In regard to *Cissampelos*, it will be seen that he has embodied all the erect shrubs, together with some climbing plants, amounting to fourteen species, into *C. ovalifolia*, and has amalgamated no less than thirty-



six of the other published species of the genus, belonging to the Old and New World, as synonyms of *C. Pereira*, acknowledging only five old and two new species, all Brazilian; but why he should have selected these five Brazilian cases only, in two of which he has mistaken their identity, and why he passed over others, which are equally remarkable for the differential characters they oppose to his type, it is very difficult to conceive. I am glad to have the opportunity of remarking that the plates in the work above mentioned, mostly from drawings by Dr. Eichler, are beautifully executed; his review of the family, and his observations on its general structure and the economic uses of its plants, are deserving of high commendation.

It is worthy of remark that, with very few exceptions, each genus of the *Menispermaceæ* is confined to a comparatively limited range; and it is a singular coincidence that, out of fifty known genera, only three original ones, *Cissampelos*, *Cocculus*, and *Menispermum*, occur in both hemispheres. The area of distribution of each of the many species of *Cissampelos* here enumerated is very limited, so that they may be said to be nearly local—a character which almost universally prevails throughout the family. The species here collated have been divided into three groups, American, African, and Asian: these again are subdivided into petate, subpetate, and palate sections, according to the different modes of insertion of the petiole upon the blade of the leaf. This plan, though arbitrary, happens to agree with the local distribution of the species, and has been adopted solely with the view of affording facility to others in studying the species and in the more easy determination of the individuals. When the results here obtained have been examined and confirmed, it will be easy to arrange the species methodically into groups and sections marked by separate characters, which will tend greatly to abbreviate the respective diagnoses.

The plants throughout the genus are dioecious, the sexes being always distinct in different plants, except in two or three instances where monoecious flowers occur: in one the sexes are found in distinct racemes in the same individual; in another male and female flowers are seen in the same raceme: but, as they accord in the usual number of their floral parts, these exceptions have (like those in *Tiliacora*) been retained in the genus; on the other hand, where a different number and disposition of the floral parts occur which, from their constancy, cannot be attributed to metamorphism, the species have been excluded, in order to preserve the uniformity and universality of the characters of *Cissampelos*. Thus, following the example of *Cyclea*, *Clypea*, *Antizoma*, &c., where this uniformity is disturbed I have formed the genus *Dissopetalum*, in which two petals are always present in the fe-

male flower, and also *Peraphora*, where the petal in the same sex is sometimes wanting, and where the floral envelopes are two deep bursiform sepals, and the putamen is echinated in a manner different from that of *Cissampelos*. *Clambus* is also constituted a genus distinct from *Cissampelos*, not only because it has six sepals and six petals in the male flower, but on account of the very different habit of its species, and the peculiar mode of venation of their leaves.

CISSAMPELOS, Linn.—*Flores* dioici, rarius monoici. *Masc.* *Sepala* 4, rarius 5 vel 6, spathulato-obovata, vel sublanceolata, submembranacea, sæpe eroso-denticulata et extus pilosa, patula, æstivatione imbricata. *Petalum* unicum, cyathiforme, interdum poculiforme, margine crenato, 4-lobum, carnosulum aut membranaceum. *Stamen* unicum, centrale; *filamentum* breve, filiforme, apice *connectivum* plus minusve disciforme peltatatum margine antheriferum fulciens; *anthera* e cellulis 4 vel pluribus in annulum circumcingentem coalitis, rima horizontali bivalvatim hiantibus.—*Fœm.* *Sepalum* unicum, ovatum vel oblongum, subconcauum. *Petalum* unicum, sepalo antepositum et multo minus. *Stamina* nulla. *Ovarium* solitariū, gibbum, 1-loculare, *ovulo* unico ad angulum ventralem appenso; *stylus* brevis, excentricus; *stigma* tripartitum, laciniis aristæformibus, divaricatis, sæpe uncinatis. *Drupa* ovata, carnosula, stylo persistente ad hilum proximo notata; *putamen* obovatum, compressum, 1-loculare, loculo hippocrepiformi, extus liris plurimis interstitiisque sulcatis radiatim crenato, intus semini conforme; *condylus* loculo circumdatus, excentricus, disciformis, extus utrinque subconvexus, intus ad hilum marginalem pro introitu vasorum tantum pervius. *Semen* hippocrepiforme vel lunatum, compressum; *integumentum* tenue, linea longitudinali in fissuram condyli infixæ; *embrya* in *albumine* simplici carnosos, hippocrepiformis, teres, tenuiter elongatus, *cotyledonibus* incumbentibus, *radicula* supera, tereti, iis æquilonga et æquilata, ad stylum spectante.

Frutices aut suffrutices sæpius alte scandentes, interdum repentes, rarius erecti, plerumque inter tropicos totius orbis crescentes; folia alterna, integra, sæpius cordato-arbicularia, petiolata, petiolo rarius palatim, sæpius plus minusve intra marginem inserto: paniculæ ♂ axillares, composite ramosæ, sæpe cymosæ, multifloræ, vel e ramulo novello aphylo aut bracteato plurimæ, hoc modo racemum floriferum efformantes; flores minuti: racemi ♀ axillares, longiusculi, sæpe ramiformes; bracteis plurimis, sæpius majusculis, faliolosis, suborbicularibus, alternatim approximatis aut imbricatis; flores minimi, pedicellati, plurimi, in axillis bractearum fasciculati et absconditi.

## I. AMERICANÆ.

\* Folia peltata; scandentes.

1. *Cissampelos tropæolifolia*, DC. Syst. i. 532; Prodr. i. 100; Deless. Icon. i. 26, tab. 98; Eichler in Mart. Fl. Bras. fasc. 38. p. 191, tab. 44;—ramulis teneris, teretibus, striatis, hirto-pilosis; foliis profunde peltatis, deltoideo-orbiculatis, imo truncatis vel rotundis, apice obtusiusculis, aristato-mucronatis, submembranaceis, 10-nerviis, supra sparsim hirsutis, margine ciliatis, subtus cinereo-glaucis et præsertim in nervis patentim hispidis, petiolo tenui, patentim hispidulo, in ♂ longiore, in ♀ brevior: inflorescentia ♂ elongata, supra-axillari, folio longiore; rachi recta, gracili, ramosa; axillis remotiusculis, bractea foliiformi petiolulata munitis, singulis paniculis 2-3 fasciculatis pubescentibus donatis, quarum pedunculo capillari, bis dichotome ramoso, sinibus semper 1-floris; ramulis ultimis spicatum pedicellatis, glabris; sepalis 4, ovato-oblongis, petaloque poculiformi glaberrimis: racemo ♀ axillari, undique hispido-piloso; bracteis alternis, sessilibus, reniformibus; floribus pedicellatis, 3-5, intra bracteas fasciculatis.—In Peruvia, Ecuador, et Brasilia: *v. s. in herb. De Boissier*, ♂ et ♀, Cuchero (Pavon); ♂, *in herb. DeCandolle*, Bahia (Blanchet, 290); *in herb. Mus. Brit.* ♂, Crato, prov. Ceará (Gardner, 1444); *in herb. Hook.* ♂, Peru (Mathews, 2057); Antioquia, Ecuador (Jervise).

In this species, as in some others of the genus, the flowers are evolved upon a slender axillary branchlet, and are perfected while the young leaves are not larger than bracts, so that the inflorescence thus assumes the appearance of a bracteated raceme: this is exceptional in the male plants, but is universal in all the female scandent plants throughout the genus, where, however, the bracts are sometimes nearly wanting; the ♀ inflorescence is therefore described by botanists as a simple raceme, although in reality it is not so. In this well-marked species the leaves are  $2\frac{1}{2}$ - $3\frac{1}{2}$  inches long, and equally broad, the insertion of the petiole being 7-10 lines within the margin, the petiole, sparsely covered with long fine soft hairs, being 2-3 inches long and slightly deflected. The rachis of the ♂ inflorescence is delicately slender, pilose, 3-5 inches long, with peltately petiolulated orbicular bracts,  $\frac{1}{4}$ - $\frac{3}{4}$  inch apart, 2-4 lines in diam., membranaceous, pilose; from the axil of each of these, three capillary corymbose panicles emanate,  $\frac{3}{4}$  inch long, dichotomously branched, generally with a single pedicellated flower in each dichotomy, the ultimate ramifications bearing several alternate pedicellated flowers, the pedicels being  $\frac{1}{2}$  line long, and the flowers glabrous; the sepals

are  $\frac{1}{2}$  line long, the petal minute,  $\frac{1}{3}$  line in diam., and the 4-lobed anther scarcely exerted. The ♀ raceme is 4–5 inches long, the imbricately bracteiform leaflets are 5–10 lines in diam., each concealing in its axil five or six flowers on glabrous pedicels; the drupes I found to be pilose, but MM. Triana and Planchon state that the ovary is glabrous.

2. *Cissampelos glaberrima*, St. Hil. Fl. Bras. i. 57; Eichl. in Mart. Fl. Bras. fasc. 38. p. 192, tab. 45;—*Cissampelos* Pareira, Vell. (non Linn.), Fl. Flum. x. tab. 138;—*Cissampelos* clematidea, Presl, Bot. Bemerk. 7; Walp. Ann. i. 18;—*alte scandens*, ubique *glaberrima*, siccitate fuscescens; ramulis teretibus, striatis; foliis profunde peltatis, suborbiculatis, imo subtruncatis, ultra medium paulo angustioribus, apice obtusissimis, emarginatis et longe mucronatis, 10–12-nerviis, supra subnitidis, fusco-viridibus, nervis pallidis prominulis, subtus pallide ferrugineo-vel cinereo-glaucis, petiolo striato, superne canaliculato, in ♂ tenuissimo, limbo multo longiore, in ♀ paulo brevior et validior: paniculis ♂ supra-axillaribus, binis, pedunculis longissimis, capillaribus, petiolo brevioribus, apice breviter 3-ramosis, ramis ebracteatis, alternatim spicatifloris, floribus pedicellatis, minusculis; vel inflorescentia e ramulo novello folio longiore racemum floriferum simulante, axillellis paniculis 2 consimilibus sed brevioribus bracteaeque foliiformi munitis; bracteis orbicularibus, peltatis, petiolulatis, superne gradatim evanescentibus; sepalis lanceolatis petaloque turbinate-campaniformi glabris; anthera 4-loba, inclusa: racemis ♀ binis vel solitariis, supra-axillaribus, folio 3-plo longioribus, rachi tenui, striata, supra basin foliolis consimilibus alternis infecundis donata, superne racemiformibus, imbricatim bracteatis, bracteis cordato-orbiculatis, brevissime palatim petiolulatis, singulis flores 4 pedicellatos fasciculatos emittentibus; sepalo oblongo; petalo orbiculari, brevior, lateribus inflexis, ambobus carnosus; ovario glaberrimo.—In Brasilia, v. v. ♂ & ♀ in montibus Organensibus et Valença, prov. Rio de Janeiro; v. s. in herb. Mus. Brit. et Hook. ♀, Pernambuco (Gardner); in herb. Hook. ex herb. Imp. Vindob. Brasilia (no. 1303).

This is a well-marked species, differing from the preceding in its entirely glabrous habit, its smaller, darker, and less peltate leaves, in their texture, and in its inflorescence. The internodes are 6 to 10 lines long; the leaves are  $1\frac{1}{2}$  inch long, 14 lines broad, with a petiole 2 inches long, inserted 4 lines within the basal margin; they become gradually smaller towards the extremities of the branches. The capillary peduncle of the axillary ♂ panicles is  $1\frac{1}{2}$  inch long, their floriferous branches forming cymose heads of very small flowers, 3 lines in diam.; the axillary

floriferous branch is 3 inches long, its lower peltate leaves, on long petioles, are 4 to 8 lines in diam., the panicles in their axils are 8 lines long, which diminish gradually upwards. The ♀ racemes are 4 to 6 inches long, the inferior peltate flowerless leaflets are 5 to 9 lines in diam., the imbricated bracts, 3 to 8 lines in diam., becoming gradually smaller, are cordate at base, with a petiolule 2 to 6 lines long palately fixed; the flowers and pedicels are 2 lines long.

I may here remark that St. Hilaire attributes to this species an herbaceous stem; but I can speak with confidence that the plants I found growing in the Organ Mountains have scandent branches, which are ligneous and tough. I did not see the main stems, which are probably more solid; but the young branches, scarcely exceeding  $\frac{1}{8}$  of an inch in thickness, exhibit the wedge-shaped ligneous masses interrupted by the radiating medullary rays, in accordance with the ordinary structure of the first year's wood of the *Menispermaceæ*.

3. *Cissampelos grandifolia*, Tr. & Pl. Ann. Sc. Nat. 4 sér. xvii. p. 44;—C. Pereira, *Eicht. (non Linn.) l. c.* p. 189;—ramulis striatis, puberulis, demum glabris; foliis profunde peltatis, amplis, orbiculatis, imo truncatis, apice subacutis vel obtusis, mucronulatis, marginibus crenato-sinuatis, 12-nerviis, submembranaceis, junioribus pube grisea adpressa subsericea indutis, adultis supra glabratis aut in nervis tantum subpuberibus, subtus thallassino-glaucis et subpubescentibus; petiolo elongato, reflexo, limbo multo longiore, valde striato, glabro; inflorescentia ♂ supra-axillari, e ramulo novello aphylo valde elongato, hinc racemiformi; rachi gracili, puberula, petiolo longiore; bracteis e foliolis parvis petiolulatis ovatis sursum evanidis utrinque sicut flores sericeo-pubescentibus; paniculis in axillis 3-4, fasciculatis, brevibus, alternatim ramosis, ramis flores pedicellatos circiter 12 umbellatim gerentibus, petalis obovatis, pallide membranaceis, extus pilosis, petalo cyathiformi, valde depresso, glabro, ♂, anthera 4-loba: racemo ♀ axillari, petiolum subæquante, obsolete pubescente, pallido, alternatim ramoso, axillellis remotiusculis bracteam parvam, flores 3-5 fasciculatos breviter pedicellatos ramulumque longiusculum apice 3-5-florum simul emittentibus, ramis sursum gradatim brevioribus et tandem evanescentibus; sepalo obovato; ovario dense piloso; drupis parvis, subglabris.—In Nova Granada: *v. s. in herb. Hook.* ♂, Maumer, Sta. P. R. R. (Hayes, 168); ♀, La Paila, (Holton, 667).

This is one of the most conspicuous species of the genus, nearly allied to the two preceding in its deeply peltate orbicular leaves, but distinguished by their much larger size and by the very

different character of both its ♂ and ♀ inflorescence. It is found in the forests, climbing to the height of thirty or forty feet. Its axils are above 3 inches apart; the leaves are 5 inches in diam., with a short acute apex, and a very slender petiole 6 inches long, inserted at a distance of  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch within the margin of the short, broad, and almost obsolete basal sinus; the smaller leaves are 3 inches in diam., on a petiole  $3\frac{1}{2}$  inches long. The ♂ inflorescence is 5–7 inches long, on a slender pendent rachis, originating 2 lines above the insertion of the petiole; this has alternate axils 3–4 lines apart, each being furnished with a sericeous acute oblong bract scarcely  $\frac{1}{2}$  line long, and three fasciculated panicles 5–6 lines long; the peduncle is  $2\frac{1}{2}$ –3 lines long, its primary branchlets  $1\frac{1}{2}$  line, each surmounted by several minute bracts and several crowded pedicellated flowers, the pedicels being of different lengths. The ♀ raceme is 6–7 inches long, with axils  $\frac{1}{2}$ – $\frac{3}{4}$  inch apart, the setaceous bracts being 1 line long, the fasciculated 1-flowered pedicels 1–2 lines long, accompanied by a floriferous branchlet 6–9 lines long, bearing 3–5 pedicellated flowers.

4. *Cissampelos sympodialis*, Eichl. in Mart. Flor. Bras. fasc. 38. p. 192, tab. 44. fig. 2;—ramulis teneris, valde flexuosis, striatis, glabris; foliis profunde peltatis, oblongis, fere triangularibus, imo rotundatis vel truncatis, sursum gradatim angustatis, apice obtusis, subemarginatis et mucronatis, margine revolutis, 9-nerviis, submembranaceis, valde reticulatis, utrinque glaberrimis, supra subnitidis, subtus paulo pallidioribus et opacioribus, petiolo tenui, striato, glabro, limbo multo brevioribus: paniculis ♂ axillaribus, 3–4, fasciculatis, patentibus pilosis, trichotome ramosis, corymbosis, pedunculo ramisque subcapillaribus, ramis ultimis spicatis paucifloris, vel in ramulo novello folio æquilongo aphylo racemum mentiente, axillis alternis bractea parva paniculisque 4 brevibus fasciculatis donatis: racemis ♀ axillaribus, geminis, folio subæquilongis, imbricatim bracteatis, rachi pilosa; bracteis profunde cordiformibus, palatim petiolulatis, apice emarginatis et mucronatis, submembranaceis, utrinque glaberrimis; axillis 7-floris; pedicellis densissime pilosis; ovariis glabris; drupis parvis, ovatis, glabris.—In Brasilia septentrionali: *v. s. in herb. Mus. Brit.* ♂ et ♀, Traipú ad Rio San Francisco, in prov. Alagoas (Gardner, 1233, 1234); ♀, Campo Grande, in prov. Piauhya (Gardner, 2474, 2472).

This is a very distinct species, which I described long ago; but, as my diagnosis was not published, the name I gave to it of course cedes to that of Dr. Eichler, though the designation *sympodialis* expresses no part of its character, there being nothing in the shape

of its inflorescence different from that of most others of this section. The magnified drawing of the ramifications of its panicle in the plate above quoted is greatly exaggerated in its proportions, and far from exact; and no one would imagine from it that the branches and pedicels are almost capillary and clothed with very long hairs. In the specimen from Paranaguá the leaves are more than one-half larger than the others; they are  $1\frac{1}{2}$ –3 inches long,  $1\frac{1}{8}$ – $2\frac{1}{8}$  inches broad, on a petiole 9–15 lines long, which is inserted 6–10 lines within the basal margin. In the ♂ plants the slender axillary peduncle, 12–18 lines long, patently pilose, has about six alternate axils, each with a very small ovate bract, scarcely a line long, and three or four fasciculated capillary pedicels 2–3 lines long, each twice dichotomously divided, with a single 1-flowered pedicel in each dichotomy, the ultimate branches bearing about five or six alternate flowers on short pedicels, all pilose; the flower has four cuneately oblong sepals clothed with long hairs outside; the petal is in the form of a depressed cup, and glabrous, the 4-lobed anther being scarcely exserted. In the ♀ plant two racemes in each axil are  $1\frac{1}{2}$ –2 inches long, the closely imbricated bracts are 3 to 6 lines in diam., the obovate sepal is extremely villous, the petal is glabrous.

5. *Cissampelos Fluminensis*, Eichl. in Mart. Flor. Bras. fasc. 38. p. 191, tab. 44. fig. 1;—ramulis glabriusculis, obsolete villosis; foliis profunde peltatis, trigonoideis, angulis basalibus rotundatis, imo in sinum latum leviter cordatis, lateribus fere rectis, apice acutis vel obtusiusculis, aristato-mucronatis, membranaceis, 9–11-nerviis, supra subconcavis, utrinque parce adpresso-pilosis, vel glabrescentibus; petiolo tenui, pilosulo, limbo subbreuiore: inflorescentia ♂ axillari, e ramulo novello foliolifero et florifero, racemum folio æquilongum mentiente; foliolis bracteiformibus, cordiformibus, aristatis et petiolulatis; paniculis aut solitariis vel pluribus fasciculatis, griseo villosis, bracteaque æquilonga in singulis axillulis, subcorymbosis, dichotome ramosis, bracteolatis, cum pedicello in quaque dichotomia, ramis ultimis subspicatum paucifloris; bracteolis setaceo-linearibus; floribus minutissimis; sepalis pilosis.—In sylvis fluv. Solimoës et Amazonas.

This species is unknown to me, but it is evidently distinct and allied to all the preceding ones; it resembles *C. tropæolifolia* in its floriferous male branchlets, where the young leaves are reduced to the size of mere bracts, and the panicles are dwindled in proportion. The leaves,  $1\frac{3}{4}$  inch apart, are  $2\frac{1}{4}$ – $2\frac{1}{2}$  inches long, with a broad basal sinus 1 line deep,  $2\frac{1}{4}$ – $2\frac{1}{2}$  inches broad, with a petiole  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch long, which is inserted 3 lines within the

margin of the sinus. The raceme-like branch is  $2\frac{1}{2}$  inches long, with axils 3 lines apart; the bract-like leaflets are 2 lines in diam., on a petiolule  $\frac{1}{2}$  line long; their panicles are  $2\frac{1}{2}$  lines long, and the flowers are therefore extremely minute.

6. *Cissampelos errabunda*, nob.;—ramulis teretibus, striatis, subglabris; foliis profundiuscule peltatis, deltoideo-orbiculatis, imo sinu levi subtruncatis, ultra medium angustioribus, apice obtusis et aristato-mucronulatis, supra opace viridibus, sparse pilosis, subtus cinereo-glaucis et puberulis; petiolo tenui, sulcato-striato, glabro, valde divaricato, limbo æquilongo: racemo ♂ axillari, solitario, petiolo dimidio brevior, e ramulo novello imo majusculè et superne brevissime bracteato, paniculigero; bracteis orbiculatis, imo petiolulatis; paniculis brevissimis, corymbosis; pedunculo bracteisque puberulis; ramis pedicellisque glabris; sepalis 4, lineari-oblongis, fuscis, glabris; petalo campanulato, triplo brevior, glabro; anthera 4-loba, inclusa.—In Brasilia: *v. s. in herb. Hook.* ♂ (Swainson).

This species is near *C. glaberrima*, differing in its larger, more deltoid leaves, which are less peltate, more cordate at base, and clothed beneath with adpressed pubescence and with a much shorter inflorescence. It differs from *C. Fluminensis* in its more peltate, more orbicular leaves, with a much shallower basal sinus, in its longer, more slender, glabrous petiole, its shorter raceme with smaller bracts, and its more glabrous habit; its flowers, with almost linear sepals, are glabrous. The axils are  $2\frac{1}{4}$  inches apart; the leaves are  $2-2\frac{1}{4}$  inches long,  $2\frac{1}{4}-2\frac{3}{4}$  inches broad, with a very divaricating slender petiole ( $2-2\frac{3}{4}$  inches long) inserted 4–5 lines within the margin of the basal sinus, which is seldom more than 1 line deep. The ♂ axillary raceme is 2–3 inches long; two or three of the lower axillets have orbicular bracts 2 lines in diameter, while in the upper axillets the bracts are reduced to the length of 1 line; the panicles are 4 lines long, alternately branched.

7. *Cissampelos longipes*, nob.;—ramulis teneribus, striatis, fuscis, retrorsum pilosis; foliis peltatis, orbiculari-ovatis, imo subito cordatis, a medio sursum curvatim angustioribus, ad apicem obtusum cuspidato-mucronatis, submembranaceis, 9–11-nerviis, supra glabris, fuscis, subnitidis, in nervis sparse pilosis, subtus incano-vel griseo-glaucis, adpresse pilosis, nervis tenerrimis, prominulis; petiolo tenui, longissimo, sparse piloso, in adultis limbum multo superante: inflorescentia ♂ e ramulo novello petiolo brevior, axillari, interdum racemiformi, cum bracteis parvis, orbicularibus, petiolulatis, subremote alternis, paniculisque brevissimis comitatis, aut aliusmodi paniculiformi



et pedunculata, pedunculo bracteam solitariam parvam foliiformem paniculasque 3 fasciculatas dichotome divisas et divaricatim corymbosas apice gerente; sepalis spathulato-oblongis, extus pilosis; petalo glabro: racemo ♀ supra-axillari; petiolo longiore, pubescente, remote bracteato; bracteis orbicularibus vel transversim latioribus, longe mucronatis, petiolulatis; floribus pedicellatis, 6-7 in axillulis fasciculatis; ovario, sepalo spathulato-oblongo, petaloque orbiculari extus pilosis; drupis sparse pilosis.—In Antilis et Guiana: *v. s. in herb. Mus. Brit.* ♂, Martinica (Rohr, 158); *in herb. Lindl. et Hook.*, ♂ & ♀, Surinam (Hostmann, 19); *in herb. Hook.* ♂, Tovar, Venezuela (Fendler, 14).

This resembles many of the foregoing species in the manner of its male inflorescence, but differs in its less peltate leaves, generally with a deep basal sinus, upon remarkably long and very slender petioles. Its axils are  $2\frac{1}{4}$ - $2\frac{1}{2}$  inches apart; the leaves are 3- $3\frac{1}{4}$  inches long, 3- $3\frac{1}{4}$  inches broad, with a basal sinus usually 3 lines deep, on a slender petiole  $3\frac{1}{2}$ -4 inches long, inserted 3 lines within the margin of the sinus; in the young branches, where the leaves are  $1\frac{1}{2}$  inch in diam., the petiole is  $1\frac{1}{2}$  inch long. The ♂ racemiform inflorescence is  $1\frac{1}{2}$  inch long, with axils 3-6 lines apart, each provided with an orbicular leaf-like bract, 2 lines in diam., and accompanied by one to three panicles, in the largest of which the capillary peduncle is 4 lines long, with two primary branches 2 lines long, each again dichotomous, and a solitary pedicel in each furcation. Sometimes the inflorescence consists of a pedicel or rachis, varying in length, with a single orbicular bract,  $1\frac{1}{2}$  line in diam., from which issue two or three panicles, 6-9 lines long, similar to those described. The ♀ raceme is  $3\frac{1}{2}$ -6 inches long, with axils 3 lines apart, each bearing an orbicular membranaceous bract, 2-3 lines in diam. (some of the lower ones often larger), on a petiolule 1 line long; the pedicels of the fasciculated flowers are 1 line long, the spathulately oblong sepal  $\frac{1}{2}$  line long, the orbicular unguiculated petal  $\frac{1}{4}$  line in diam.

8. *Cissampelos Pareira*, Linn. Sp. 1473; Lam. Ill. t. 830; Sw. Obs. 380, t. 10. fig. 5; DC. Syst. i. 533, Prodr. i. 100; Hook. & Th. (non Linn.) Fl. Ind. i. 198; Eichl. (non Linn.) in Mart. Fl. Bras. fasc. 38. 188;—*Cissampelos Cocculus*, *in parte*, Poir. Encyc. v. 9;—*Cissampelos Kohautiana*, Presl, Rel. Hænk. ii. 81;—*Clematis baccifera*, Plum. Am. 78, t. 93;—ramulis teretibus, striatis, glabriusculis vel sparse retrorsum pilosulis; foliis peltatis, deltoideo-ovatis vel orbicularibus, imo sinu lato cordatis, summum versus paululo angustioribus, apice plus minusve obtusis, sæpius emarginatis et aristato-mucronatis,

9-11-nerviis, adultis supra glabris vel sparse puberibus, subtus sericeo pubescentibus, margine ciliatis; petiolo limbo paulo brevior, imo subito reflexo: paniculis ♂ supra-axillaribus, solitariis vel 3 fasciculatis, petiolum æquantibus vel brevioribus, bis dichotome ramosis cum pedicello in dichotomiis, ramis ramulisque filiformibus vel capillaribus, divaricatis, pubescentibus, ramulis ultimis spicatum pedicellatis; floribus minimis, congestis, hinc subcorymbosis; sepalis hispido-pilosis: racemis ♀ folio longioribus, imbricatim bracteatis; bracteis spicatis, foliosis, suborbicularibus, subsessilibus; pedicellis unifloris, intra bracteam 5-6 fasciculatis; sepalo ovato, subunguiculato; petalo subrotundo, illo dimidio brevior; drupis coccineis, subrotundis, compressis, pilosis.—In Antillis et America intertropicali: *v. s. in herb. DC.* ♂ & ♀, San Domingo (Poiteau); *in herb. Lindl.*, San Vicente and Trinidad; *in herb. Hook., inter multas alias*, Panama (Seemaun, 313), Jalapa, Campeche (Linden, 926), S. Vincent, ♂ & ♀ (Guilding), Mexico Orizaba (Brotero, 854); *in herb. Mus. Brit.*, plurimae e variis locis.

In the time of Plumier and Linnæus, the plants then known of *Cissampelos* were few, and divided into two species—*C. Pareira*, where the leaves were peltate, and *C. Caapeba*, where the petiole was inserted on the margin of the blade. Subsequently, in proportion as botanists began to pay more attention to the many characteristic features of plants, the number of species necessarily increased. In this manner the individual species enumerated in DeCandolle's 'Prodromus' (1824) were twenty-eight, which number has been more than doubled by subsequent botanists. Lately, as before mentioned, the authors of the 'Flora Indica,' in their summary annihilation of species, have gone further than was done in the time of Linnæus; for they make *C. Caapeba* identical with *C. Pareira*, and drown in this type nearly all the species of the genus found in the various parts of the globe. I have already protested against this attempt, and will recur to the subject when we come to describe *C. Caapeba*. *C. Pareira*, as distinguishable from a host of others, is sufficiently susceptible of specific determination; and although variable in the size and shape of its leaves and in the development of its inflorescence, a wide limit has been assigned to these variations in the above diagnosis. In the extent of its range, this species appears confined to the West India Islands and the more torrid regions of the American continent which border upon the great western archipelago, where it seems abundant. Its leaves are generally  $1\frac{1}{2}$ – $2\frac{1}{2}$  inches long and of the same breadth, with a basal sinus 1 or 2 lines deep, the petiole ( $1\frac{1}{2}$ –2 inches long) being inserted 2 or 3 lines within the margin of the sinus. The ♂ panicles,

with an almost capillary peduncle, and lax, widely divaricated branches, are 1-1½ inch long, spreading to an equal breadth. Its dichotomous mode of ramification, twice repeated, with a solitary pedicel in the sinus of each division, the ultimate rays being so closely divided as to assume a spicated appearance, is a form of inflorescence very general in *Cissampelos*; and although not always so pronounced as in this species, it generally prevails under some modification: when it is triehotomously divided, as occurs in some species, the panicle assumes another character. The sepals are ovate and subacute. The ♀ raceme is always furnished with suborbicular leafy bracts with ciliated margins, which are very imbricate and conceal the flowers, the bracts being generally about ½ inch in diameter. These ♀ racemes are almost universally simple; but, though rarely, they are sometimes ramified; and I have now before me a specimen where the axillary raceme, only 5 inches long, has its lower axils furnished with leaf-like petiolated bracts, 7 lines long, 9 lines broad, each throwing out a simple branch, 1-2 inches long, which resembles the terminal moiety of the main raceme, and each is provided with imbricated, nearly sessile bracts 2-4 lines broad, and corresponding fascicles of short pedicellated flowers. This proves what I have before remarked, that the simple ♀ raceme in this genus is in reality a young branch arrested in its growth by the early production of flowers in its axils, and where (perhaps in consequence) both leaves and flowers are stunted in their proportions.

9. *Cissampelos acuta*, Tr. & Pl. Ann. Sc. Nat. 4 sér. xvii. p. 43; — *Cissampelos* Pareira, *Eichl. (non Linn.) l. c.* p. 189; — foliis peltatis, deltoideo-oblongis, paulo cordatis, gradatim acute acuminatis, mucrone longo valido apiculatis, 7-12-nerviis, supra in junioribus adpresse pilosis, in adultis glabris, fusco-viridibus, subtus ferrugineo tomentosis, nervis paulo prominulis, marginibus ciliatis; petiolo subtenui, limbo paulo brevior, pubescente: paniculis ♂ axillaribus, geminis, cum altera e ramulo novello florifero folium duplo et ultra superante, ebracteata, vel hinc inde bractea parva ornata; pedicellis gracilibus, bracteolis setaceis, floribusque minutis griseo pilosulis: racemis ♀ axillaribus, e ramis novellis enatis, imo foliosis, superne bracteatis; bracteis subcordato-deltoideis, aristatis, breviter petiolulatis; floribus pedicellatis, intra bracteas fasciculatis.—In Ecuador et Peruvia: ♂, Las Pavas, Quindiu (Triana); v. s. ♀ in *herb. de Boissier*, Peru (Pavon).

A species recognizable by its deltoid, very acute, cuspidate leaves, which in shape approach those of *C. sympodialis*, and differ from those of the preceding species in being longer and

very acutely acuminate, with an unusually long, cuspidate point. I have not seen the typical ♂ plant, which M. Triana describes as having leaves 5 centim. (2 inches) in diam. In Pavon's ♀ plant, which agrees with M. Triana's diagnosis, and which I have consequently referred to this species, although it does not become black in drying, probably owing to its place of growth, the leaves, with straight converging sides, very slightly cordate at base, are  $2\frac{3}{4}$ – $3\frac{1}{4}$  inches long,  $2$ – $2\frac{1}{4}$  inches broad, on a slender tomentose petiole, thickened at its extremities and suddenly reflected at its origin,  $1\frac{3}{4}$  inch long; this is inserted 3 lines within the margin of the basal sinus, which is 1–2 lines deep; the stout cuspidate point is 3 lines long. The floriferous young branch bears three or four much smaller leaves towards its base, and terminates in a spicated raceme 2 inches long, the bracts being 3–4 lines long, 2–3 lines broad, on a petiolet 1–2 lines long, and being plicated in vernation.

10. *Cissampelos Orinocensis*, H. B. K. v. 68;—*Cissampelos Pareira*, Eichl. (non Linn) l. c. 189;—ramulis tenerrimis, striatis, glabris vel sparse pubescentibus; foliis peltatis, deltoideo-orbiculatis, imo truncatis, e medio sumimum versus sinu levissimo angustioribus, acumine obtuso et mucronato, membranaceis, 9–11-nerviis, supra viridibus, subglabris vel sparse pilosis, subtus pallidioribus, densius sericeo pilosis, marginibus pilis longis fulvis ciliatis; petiolo tenerrimo, limbo paulo brevior, subglabro: inflorescentia ♂ axillari, racemosa; rachi tenuissima, e basi alternatim laxe ramosa; ramis interdum bractea foliiformi imo donatis, alternatim bracteolatis, paniculiferis; paniculis trichotome divisis pedicellisque capillaribus: racemo ♀ axillari, folium vix superante.—In regione Rio Orinoco: v. s. ♂ in herb. Lindl., Coro del Tigre (Oelbe, 1882).

This species approaches *C. Fluminensis* in the shape of its fringed leaves, which are less deltoid and less acute, but differs in its more filiform petiole and the very unusual character of its ♂ inflorescence, in which respect it bears some analogy to *C. tropæolifolia*. The branches are slender and virgate, with axils  $2$ – $2\frac{1}{2}$  inches apart; the leaves are  $2$ – $2\frac{1}{4}$  inches long,  $1\frac{3}{4}$ – $2\frac{1}{8}$  inches broad, with a petiole  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch long, inserted 2–3 lines within the truncated basal margin. The extremely slender ♂ inflorescence is branching and racemose, on a filiform rachis  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches long, having a basal panicle and, at intervals of  $\frac{1}{4}$  to  $\frac{1}{2}$  inch, several alternate fascicles of three shorter similar panicles, all of which are trichotomously divided, orbicular bracts  $2$ – $2\frac{1}{2}$  lines in diam. being sometimes found at the origin of each fascicle, but they are generally wanting.

11. *Cissampelos testudinum*, nob.;—*Cissampelos* Pareira, *J. D. Hook.* (non Linn.) *Linn. Trans.* xx, 233;—ramulis striatis, valde brunneo tomentosis; foliis subpeltatis, ovalibus vel late obovatis, imo rotundatis vel subtruncatis, lateribus arcuatis, apice vix acutis vel obtusulis, aristato-mucronulatis, 10–12-nerviis, supra viridibus, pubescentibus, subtus marginibusque cinereo tomentosis; petiolo tenui, patentim sericeo piloso, limbo æquilongo: paniculis ♂ axillaribus, 3, fasciculatis, pilosis, iterum et divaricatum dichotome ramosis, cum pedicello in quaque dichotomia, ramis ultimis spicatum pedicellatis; floribus minutis; sepalis 4, obovatis, hirsutissimis; petalo cyathiformi, piloso; anthera 4-loba: racemis ♀ geminis, axillaribus, tomentosis, folio paulo longioribus, imbricatum bracteatis, rachi flexuosa; bracteis subpeltatis, breviter petiolulatis, suborbicularibus, acutis, mucronulatis, subtus margineque brunneo-tomentosis; floribus in axillis, 5, pedicellatis, fasciculatis; sepalis cuneato-oblongo, fusco, extus hirsuto; petalo dimidio brevior, fere ad basin bilobo, lobis spathulato-oblongis, fuscis, glabris; ovario dorso hirsuto; stylo glabro, longiusculo; stigmatibus 3, reflexis, scabridis.—In ins. Galapagos: *v. s. in herb. Hook.* ♂ & ♀, Charles and James Islands (Darwin, 239).

The specimens are not in very good condition, and certainly bear no resemblance to *C. Pareira*; they constitute a very distinct species, with decided differential characters, one of the chief peculiarities consisting in having the petal in the female flower very deeply cleft, but entire at the base, with a single point of insertion within the claw of the sepal: in this respect it differs from *Dissopetatum*, which has two distinct petals, with a wide interval between the points of their insertion: in the form and size of its leaves it approaches *C. Orinocensis*. The leaves are 2–2½ inches long, 1¾ inch broad, on a petiole 2 inches long, which is inserted 2½–3 lines within the basal margin. The ♂ panicles, with capillary branches, are 9–12 lines long, 9 lines broad, the peduncle measuring 4 lines, the primary rays 3 lines, the secondary ones 1–2 lines, the solitary pedicel in the principal bifurcations being 2 lines long. The ♀ raceme is 2–3 inches long, the bracts 6 lines in diam., diminishing upwards to a breadth of 1 line; the pedicels are 1 line long, the sepal the same length, the petals half that length.

12. *Cissampelos limbata*, nob.;—ramulis striolatis, pallide vel fulvo tomentosis, demum glabrescentibus; foliis peltatis, deltoideo-ovatis vel latioribus, imo profundiuscule sinuato-cordatis, sursum lateribus arcuatis gradatim angustioribus, apice plus minusve obtusis vel emarginulatis, et mucronatis, 10-nerviis, supra luride opacis, sparse pilosulis et in nervis

impressis flavido tomentellis, marginibus cano vel ferrugineo lanatis, subtus pilis subferrugineis aut flavidis sericeo pubescentibus; petiolo subtenui, limbo paulo brevior, tomentoso: paniculis ♂ in axillis 1-3, fasciculatis, subpilis, petiolum æquantibus, gracillime ramosis, ramis ramulisque sæpe bracteolatis, dichotome divisis, interdum altera racemiformi comitatis (aut solitaria), e ramulo novello bracteato et florifero producta; bracteis foliiformibus aut interdum setaceis; paniculis brevissimis; pedicellis flore longiusculis; sepalis 4-5, extus pilosis; petalo glabro: racemis ♀ axillaribus, solitariis, spicatis, tomentosis; bracteis ovatis, acutis, breviter petiolulatis, subtus tomentosis, marginibus aureo lanatis; floribus in axillulis 7-8, fasciculatis, pedicellatis; drupis parvulis, hirsutis.—In Peru, Nova Granada, et Brasilia: *v. s. in herb. DC.* ♂ & ♀, Cuchero, Peru (Pavon); *in herb. Hook.* ♀, Ibague, Nov. Granada (Holton, 668); ♀, Minas Geraës (Claussen).

This species differs from the preceding in its more deeply cordate leaves (which have a peculiarly lurid aspect), pale immersed nerves, and light or golden woolly margins. The leaves are  $2\frac{1}{4}$ - $2\frac{3}{4}$  inches long,  $2$ - $2\frac{1}{2}$  inches broad, on a petiole  $1\frac{1}{2}$ - $1\frac{3}{4}$  inch long, inserted 2-4 lines within the margin of the basal sinus, which is 2-3 lines deep. Each axil bears one, or often three panicles on a peduncle 3 lines long, with two branches 2 lines long, each again divided into two others 3 lines long, crowded with numerous pedicellated flowers; in the same axil, or sometimes solitary in the axil, there is a raceme-like panicle, with a rachis 4 inches long, bearing at intervals of 6-8 lines an orbicular bract 2 lines in diam., sometimes almost obsolete, and a short corymbulose panicle like those in the main axils. The ♀ raceme,  $2\frac{1}{2}$  inches long, is furnished with several bracts, which are orbicular, cuspidated, and petiolulated, 2-3 lines in diam., and 4 lines apart; the sepal is spathulately oblong, pilose, reflected, the petal being erect, orbicular, fleshy, and glabrous; the ovary and pedicel are densely pilose.

\*\* Folia subpeltata; plantæ scandentes.

13. *Cissampelos Benthiana*, nob.;—*Cissampelos acuminata*, Benth. (non DC.) in *Pl. Hartw.* 445; *Walp. Rep.* i. 97;—*C. Pareira*, Eichl. (non Linn.) *l. c.* p. 189;—ramulis striatis, subpuberulis; foliis subpeltatis, imo retuso-truncatis, in ♂ oblongis, e medio sursum gradatim attenuatis, valde acuminatis, acutis et cuspidato-mucronatis (in ♀ deltoideis, apice obtusis et mucronatis), 7-nerviis, supra glabris, vel sparse pilosis, subtus pallidioribus et velutino pubescentibus, marginibus ciliato-pilosis; petiolo gracili, folii fere longitudine,

flavido pubescente: paniculis ♂ axillaribus, plurimis (3-8), fasciculatis, petiolo fere æquilongis, subcorymbosis; pedunculo ad apicem ramoso, ramis circiter 6, subfasciculatis, bis dichotome divisis cum pedicello in sinu, ramulis ultimis spicatum plurifloris; paniculaque altera e ramulo aphylo folio longiore, alternatim fasciculato-ramoso, ramis e paniculis breviusculis, dichotome corymbosis; sepalis spathulato-ovatis, extus pilosis; petalo depresso, margine crenulato; anthera 4-loba: racemis ♀ axillaribus, binis vel solitariis, folio subbrevioribus, reflexis, subremote bracteatis, bracteis orbicularibus pilosis, floribus pedicellatis 5 fasciculatis munitis; sepalo spathulato-oblongo, extus piloso, petaloque reniformi 4-plo brevior extus piloso; ovario hirsutissimo.—In Mexico: *v. s. in herb. Hook. et alior. ♂ & ♀* (Hartwegg, 445).

A very decided species, with flexuose branches, having its axils  $1\frac{1}{2}$ -2 inches apart. In the ♂ the leaves are gradually attenuated, acutely acuminate, with a long mucronate point, and have an almost obsolete sinus at the base, with an elongated, very slender petiole; they are  $2-3\frac{1}{4}$  inches long,  $1\frac{3}{4}$ -2 inches broad, the petiole ( $1\frac{3}{4}$ -2 inches long, and subdeflexed) being inserted  $1-1\frac{1}{2}$  line within the basal margin. In the ♀ the leaves are trigonoid, slightly sinuated at the base, gradually narrowing towards the obtuse summit, being 2 inches long, 2 inches broad, with a petiole 2 inches long inserted 2 lines within the margin. Several ♂ panicles are crowded in each axil,  $1\frac{1}{2}$  inch long; the peduncle, 5 lines long, bears five fasciculated branches, 5 lines long, dichotomously divided, the secondary branchlets bearing numerous minute flowers; the aphyllous floriferous branch is  $4\frac{1}{2}$  inches long, has axils 4 lines apart, each bearing three to five panicles, 9 lines long; there is rarely a single leaflet at the base of this aphyllous raceme, 7 lines long, 3 lines broad, on a petiole 4 lines long. The ♀ raceme is  $2-2\frac{1}{2}$  inches long; the bracts, about  $2\frac{1}{2}$  lines apart, are 2-3 lines in diameter.

14. *Cissampelos heterophylla*, DC. Syst. i. 534; Prodr. i. 101;—C. Pareira, *Eichl. (non Linn.) l. c.* p. 189;—ramulis teneribus, torto-striatis, glabriusculis; foliis peltatis, obovatis, imo sinu rotundo cordatis, vel subtruncatis, apicem versus curvatim angustioribus, summo obtusiusculis, submarginatis et aristato-mucronatis, 7-9-nerviis, supra fusco-viridibus, glabris, junioribus puberulis et margine ciliatis, subtus sordide glaucis, pilis paucis adpressis puberulis; petiolo subtenui, limbo æquilongio vel paulo brevior, subpuberulo: inflorescentia ♂ axillari, racemiformi, pubescente, e ramulo novello florifero, folio longiore; axillis remotiusculis, bractea foliiformi paniculisque 3

fasciculatis donatis; bracteis suborbicularibus, gradatim minoribus, utrinque puberulis, subtus pallidioribus, longiuscule petiolulatis; pedunculis 2-3-chotomis; ramulis apice pedicellis plurimis subumbellatim congestis munitis: racemis ♀ axillaribus, solitariis aut binis, petiolo æquilongis vel 2-plo excedentibus, pubescentibus; rachi tenuissima, valde flexuosa; bracteis parvis, remotis, orbicularibus, petiolulatis; floribus 8-10, in axillis fasciculatis, pedicellatis; sepalo oblongo, membranaceo, extus longe piloso; petalo cuneato-reniformi, dimidio longitudinis, glabro, opaco; ovario piloso; drupis parvis, pilosis.—In Antillis et Mexico: *v. s. in herb. meo*, ♂, Jamaica (Heward); *in herb. Hook.* ♂, Jamaica (Distan); ♀, Trinidad (Schach).

These plants agree with DeCandolle's description of the type from San Blas a locality on nearly the same parallel of latitude. The internodes are  $2\frac{1}{2}$  inches long, the leaves  $2\frac{1}{2}$ - $2\frac{3}{4}$  inches long,  $2\frac{1}{4}$ - $2\frac{1}{2}$  inches broad, with a basal sinus 2 lines deep, on a petiole 2 inches long, which is inserted  $1\frac{1}{2}$  line within the margin of the sinus. The axillary floriferous branch is 5 inches long; its lower axils, which are 6 lines apart, approach gradually to a distance of 3 lines; the lower bracts, 7 lines in diam., have a petiolule 6 lines long, the upper ones are gradually lessened to a diameter of 3 lines; the peduncles are 3-4 lines long, their branches, 1-2 lines long, with pedicels  $\frac{1}{2}$ - $\frac{3}{4}$  line long. The ♀ racemes are  $2\frac{1}{2}$ -4 inches long; the bracts,  $\frac{1}{2}$  inch apart, are 2-3 lines in diameter; the drupes are 2 lines long.

15. *Cissampelos scutigera*, Tr. & Pl. Ann. Sc. Nat. sér. 4. xvii. p. 42;—C. Pareira, *Eichl. (non Linn.) l. c.* p. 189;—foliis peltatis, cordato-ovatis, mucronulatis, rigide chartaceis, 7-nerviis, supra puberulis, subtus (sicut caulis inflorescentiaque) tomento griseo indutis: paniculis ♂ geminis, folio sæpius longioribus, bracteatis; bracteis petiolatis, ovatis, acutis, sæpe in folium abeuntibus, cymulis partialibus 2-5, fasciculatis, pedunculatis, bractea longioribus; pedicellis pro genere longiusculis, floribusque minutis, extus pilosulis, in ♀ foliis similibus, petiolo tenui, limbo æquilongo, puberulo: racemis ♀ geminis, axillaribus, petiolum fere æquantibus; bracteis orbicularibus, subimbricatis.—In Nova Granada et isth. Panama; ♂, Quebrada Grande Bogota (Triana): *v. s. in herb. Hook.* ♀, Panama (Hayes, 186).

Not having seen the typical plant described by MM. Triana and Planchon, I have copied their diagnosis *verbatim*, and have ventured to regard the plant from Panama as the female of the same, because it agrees with it in the character of its leaves



and is from the same region. In the above diagnosis of the ♂ inflorescence, the panicles there described appear to be young floriferous branches, whose axils, with petiolated foliiform bracts, produce from two to five fasciculated "cymules," the peduncles of which are longer than the bracts, which are  $\frac{1}{2}$  inch (4 millim.) long. They state that the species differs from *C. Pareira* in the more oval and acute form of its leaves, and that it approaches their *C. myriocarpa* in general appearance. In the plant which I have conjectured to be the ♀ of the same species, the branch is very slender, with axils about 2 inches apart; the leaves slightly cordate at base, obtuse or somewhat acute and mucronated at the apex, with a few long adpressed hairs above, canoglaucous and puberulous below,  $2-2\frac{1}{4}$  inches long,  $1\frac{7}{8}-2$  inches broad, with a broad basal sinus 1 line deep, on a very slender petiole 2 inches long, which is inserted  $1\frac{1}{2}$  line within the margin of the sinus. The ♀ racemes are  $1\frac{1}{2}-2\frac{1}{2}$  inches long, with orbicular subimbricate bracts, 2 lines in diam., which diminish upward to half that size.

16. *Cissampelos littoralis*, St. Hil. Fl. Bras. i. 54; St. Hil. & Tul. Ann. Sc. Nat. sér. 2. xvii. 136;—*C. Pareira*, Eichl. (non Linn.) in Mart. Fl. Bras. fasc. 38. 189;—ramulis teneribus, striatis, retrorsum pubescentibus; foliis parum peltatis, suborbicularibus, vel subdeltoideis, imo cordatis, apicem versus acutiusculis aut rotundato-obtusis, emarginatis et mucronatis, margine sub-revoluta, 5-7-nerviis, supra nitidiusculis, in nervis flavidis venisque reticulatis subprominulis sparse pilosis, subtus pallidioribus, glaucis, cinereo pubescentibus; petiolo limbo fere triplo brevior, apice paulo incrassato, imo retorto, patentissime et dense piloso: racemo ♂ axillari, rachi filiformi, folio duplo longiore, patentim flavido pilosa, e basi sursum florifera, axillulis remotiusculis, rarius bractea parva orbiculata, sæpius bracteola minima cymulisque 2-3 fasciculatis munitis; pedunculo capillari, piloso, bis dichotome diviso, cum pedicello in dichotomiis; floribus capitato-cymosis, minutis; sepalis spathulato-oblongis petaloque cyathiformi 4-sulcato extus hispido-pilosis: racemis ♀ axillaribus, geminis vel solitariis, imo nudis, axillulis remotiusculis, bractea parva orbiculari petiolulata floribusque pedicellatis munitis; sepalo oblongo, extus piloso; petalo dimidio brevior, reniformi, imo unguiculato, apice retuso, glabro; ovario piloso; stylo brevi; stigmatibus 3, late linearibus, obtusis, subdivaricatis.—In Brasilia: v. s. in herb. meo, ♂, prov. Piahy (Gardner, 2475); in herb. Hook. ex herb. Imp. Vindob. ♂ et ♀, Brasilia (No. 1302).

This species differs from *C. gracilis* in its more orbicular.

more reniform, and more deeply cordate leaves, with shorter and more densely pilose petioles; in its mode of inflorescence it resembles it, as well as *C. andromorpha*. Its internodes are 3–3½ inches long; the leaves are 2¼–2½ inches long, 2¾–3 inches broad, with a somewhat acute basal sinus ½ inch deep, and a petiole 1¼ inch long, inserted ½ line within the margin of the sinus. The ♂ raceme is 5½ inches long, with a slender and very woolly rachis, which is divided at intervals of ½ inch by axillets commencing at the base, which are furnished with an acutely oval bract ½ line long, and three or four fasciculated cymules, each 3 or 4 lines long, with short dichotomous branches terminated by a subcapitate head of very minute flowers; rarely a few of the more inferior axillets have a leaf-like bract 2 or 3 lines in diameter. The ♀ raceme is 3 inches long, on a slender rachis, with bracts ¼ inch apart, 2 lines in diameter, diminishing upwards.

MM. St. Hilaire and Tulasne considered this species to be identical with *C. mucronata* of Richard, a plant widely diffused over Southern Africa; but that will be found to be very different.

17. *Cissampelos gracilis*, St. Hil. Fl. Bras. i. 56;—*Cissampelos* Pereira, *Eichl. (non Linn.) in Mart. Fl. Bras. fasc. 38. 189*;—ramulis gracilibus, profunde sulcato-striatis, glabratis; foliis subpeltatis, subdeltoideis, imo inter angulos rotundos sinu levissimo subtruncatis, e medio sursum acutangulatis, apice acuto, vel hebetato et emarginato, mucrone longo cuspidatis, 5–7-nerviis, supra obscure viridibus, nitidis, nervis pilis sparsis indutis, subtus ferrugineis et pubescentibus, nervis vix prominulis; petiolo gracili, superne canaliculato, pubescente, limbo dimidio brevior: inflorescentia ♂ e ramulo novello supra-axillari subpuberulo, folio 2–3-plo longiore, racemum simulante; foliolis subbracteiformibus, deltoideis, puberulis, mucronatis; paniculis axillaribus, 2–5, fasciculatis, foliolis 2-plo longioribus; pedunculo dichotome diviso ramisque capillaribus et subglabris, cum pedicello longo in dichotomiis; floribus minutis; sepalis late obovatis, membranaceis, extus pilosis; petalo cyathiformi, membranaceo, glabro, radiatim nervoso; anthera 4-loba.—In Brasilia meridionali: v. s. in herb. Soc. Reg. Hort. ♂, Rio Tibagi, prov. S. Paulo (Weir, 420).

This species approaches *C. Australis*, St. Hilaire, but differs in its glabrous polished branches, its more peltate and more acute leaves, their shorter and subglabrous petiole, and in the form of its inflorescence. Although approaching *C. littoralis* in the style of its inflorescence, it is very dissimilar in other respects.

Its internodes are  $2\frac{1}{4}$ – $2\frac{1}{2}$  inches long; the leaves are  $2\frac{1}{2}$ – $2\frac{3}{4}$  inches long, including the very broad basal sinus 2 lines deep and  $2\frac{1}{2}$  inches broad, on a petiole  $1\frac{1}{4}$  inch long, which is inserted 1 line within the margin. The racemiform inflorescence is 6–9 inches long, with axils  $\frac{1}{2}$  inch apart, each bearing a small leaflet, often caducous, of a roundish deltoid shape, 3–5 lines long, 2–3 lines broad, with a short petiole; each panicle is  $\frac{1}{2}$ – $\frac{3}{4}$  inch long, its peduncle being half that length, the pedicels  $\frac{3}{4}$  line long; the flower expanded scarcely exceeds  $\frac{1}{2}$  line in diameter.

18. *Cissampelos microcarpa*, DC. Syst. i. 534; Prodr. i. 101; Maefad. Jam. 17;—*Cissampelos* Pareira, *Eichl. (non Linn.) in Mart. Fl. Bras. fasc. 38. 189*;—ramulis teretibus, spiralliter sulcato-striatis, glabriusculis vel subpuberulis; foliis suborbicularibus, imo subcordatis vel fere truncatis, in ♂ magis cordatis et ovatoribus, apice emarginatis et mucronulatis, 7-nerviis, nervis rectis furcatim divisim et paulo divergentibus pallidis prominulis, venis reticulatis immersis, supra glabrescentibus vel pilis sparsis donatis, subtus flavido-opacis et pilis adpressis tomentosis; petiolo subtenui, supra canaliculato, limbo breviori aut subæquilongo, flavido tomentoso vel glabriore: paniculis ♂ axillaribus, 3–4, fasciculatis, petiolo brevioribus, composite divisim et laxe dichotomis, cum pedicello in dichotomiis; pedunculo ramulisque capillaribus minime bracteolatis, subpuberulis, vel a ramulo novello axillari racemum floriferum simulante comitatis, axillulis basalibus foliolosis et nudis, superioribus bracteatis et floriferis; bracteis orbiculatis, brevissime petiolulatis, utrinque sericeo-puberulis; floribus in axillulis paucis, fasciculatis et pedicellatis; baccis parvulis, sparse pilosis.—In Antillis: *v. s. in herb. DC.* ♀, Cuba (Ramon de la Sagra, 191); *in hb. Lindley*, ♂, Cuba (Wright, 22); *in hb. Hook.* ♂ & ♀, Cuba (Wright, 21 & 22); ♂ & ♀, Jamaica (Marsh, 19); ♂, Venezuela (Fendl. 13).

This is a species as widely distributed through the West Indies as *Cissampelos Pareira*, to which DeCandolle considered it to be closely allied; but it differs in its leaves being very little peltate, in their more tomentose covering, their shorter petioles, and its much smaller putamen. From *C. heterophylla*, a native of the same regions, it may be recognized by its less peltate and more tomentose leaves, with shorter petioles, and by the absence, in its ♂ racemes, of the very long-petioled bracts which distinguish that species. The leaves are  $2\frac{1}{4}$ – $3\frac{3}{4}$  inches long, 2–3 inches broad, with a basal sinus 1–2 lines deep, on a petiole  $1\frac{1}{4}$ –2 inches long, inserted  $\frac{1}{2}$  line within the margin of the sinus. The ♂ panicles are  $\frac{3}{4}$ – $1\frac{1}{4}$  inch long, broadly and laxly spread; the

raceme-like branch which often accompanies them is about  $4\frac{1}{2}$  inches long, the three lower axils at intervals of  $\frac{3}{4}$  inch, bearing a leaflet about  $\frac{1}{2}$  inch in diam., the upper axils being closer and generally bractless or with a minute bracteole. The ♀ racemes vary in length, having generally one or two flowerless leaflets near the base,  $\frac{3}{4}$ – $1\frac{1}{4}$  inch in diam., on a petiole of half that length; beyond them the bracts are orbicular, nearly sessile, 2 lines apart, 3 lines in diam., bearing in their axils one to three pedicellated drupes, the putamen being  $1\frac{1}{2}$  line long and 1 line broad.

19. *Cissampelos Hankeana*, Presl, Reliq. Hænk. ii. 80; Walp. Rep. i. 97;—*Cissampelos ovalifolia*, Eichl. (non DC.) in Mart. Fl. Bras. fasc. 38. 189;—ramulis teretibus, striatis, dense pubescentibus; foliis subpeltatis, subdeltoideo-orbiculatis, profunde cordatis, lobis basalibus rotundatis, sinu subacuto, sursum gradatim angustioribus, apice canaliculato-recurvo subacutis et mucronatis, 7–9-nerviis, chartaceis, supra viridibus, nitentibus et glabrioribus, vel opacioribus et sparse pilosis, nervis flavidis, prominulis, venis reticulatis, marginibus subrevolutis et sericeo ciliatis, subtus flavidis vel umbrino-glaucis, præsertim in nervis sericeo tomentosis; petiolo subvalido, sæpe limbo longiore, striatello, flavo tomentoso, imo tumidulo et subito incurvo: paniculis ♂ 3, axillaribus, fasciculatis, petiolo subæquilongis, flavido tomentosis, mox a basi alternatim ramosis; ramis longiusculis, flexuoso-divaricatis; ramulos plures umbellatim gerentibus, radiis apice capitulis globosis 3–4 pedunculatis munitis: racemis ♀ binis aut solitariis, spicatis racemiformibus, ferrugineo tomentosis, axillulis approximatis, bracteatis; bracteis orbiculatis, imbricatis, complicatis, breviter petiolulatis; floribus circiter 7, pedicellatis, in axillulis fasciculatis; sepalo oblongo, extus hirsuto; petalo orbiculari illo dimidio brevior, extus piloso; ovario hirsutissimo; drupis parvis, pilosis.—In Peruvia et Ecuador: *v. s. in herb. De Boisier*, ♂ & ♀, Cuchero (Pavon, sub nom. *C. cordata*, R. & P.)

This is a plant agreeing with Presl's description in all respects except in the colour of the tomentum, which is always a variable feature; it offers some approach to *C. microcarpa*, especially in the small size of the drupes, but differs in the character of its leaves and inflorescence. The internodes are  $1\frac{1}{2}$ – $2\frac{1}{2}$  inches long; the leaves are  $3\frac{1}{4}$ – $3\frac{1}{2}$  inches long, 3– $3\frac{1}{4}$  inches broad, with the sides roundly converging towards an acute and somewhat recurved apex, a narrow basal sinus 6 lines deep, and a petiole 2– $2\frac{3}{4}$  inches long, inserted  $\frac{1}{2}$  line within the margin. The ♂ panicles are 2– $2\frac{1}{2}$  inches long, bare for about  $\frac{1}{2}$  inch at base, thence branching alternately, the branches simple or umbellately divided into

five to eight spreading curved rays  $\frac{1}{2}$  inch long, and again branching into three or four capitate heads of many minute aggregated flowers; sepals oblong, acute at both ends; petal very depressed, subfleshy, smaller than the nearly sessile 4-lobed anther, sparsely pilose outside: the whole densely hispido-tomentose. The ♀ raceme is 3 inches long, its many orbicular folded bracts, on short petiolules, are 3 lines in diam., acute at the apex; at the origin of each about five fasciculated pedicels arise, 1 line long, each bearing a single flower; the sepal is 1 line long, the petal is half that length; the gibbous ovary is 1 line long and densely hirsute; the drupe is black, orbicular, compressed, pilose,  $1\frac{1}{2}$  line in diameter.

20. *Cissampelos hirsutissima*, Presl, Reliq. Hænk. ii. 80; Walp. Ann. i. 97;—*Cissampelos tomentosa*, H.B.K. (*non DC.*) v. 68;—*Cissampelos ovalifolia*, Eichl. (*non DC.*) in Mart. Fl. Bras. fasc. 38. 187;—ramulis pilis patentibus, rigidulis, obscure flavidis densissime hirsutulis; foliis suborbicularibus, vix peltatis, imo sinu acuto cordatis, apice obtusissimis, submarginatis et mucronulatis, submembranaceis, 5-nerviis, supra læte viridibus, pilis adpressis sericeo-pilosis (in junioribus aureo velutinis), subtus flavo tomentosus, nervis aureis, marginibus dense aureo lanatis; petiolo imo apiceque incrassato, pilis longis patentibus aureis dense hirsuto-tomentoso, limbo brevior, in ♀ longiore et tenuiore: paniculis ♂ geminis, axillaribus, petiolo brevioribus, dense aureo pilosis, dichotome ramosis cum pedicello in dichotomiis, ramis ultimis globose capitatis, sæpius racemo e ramulo novello comitatis, axillis bractea parva foliiformi cymulisque 2–3 fasciculatis brevibus donatis, omnibus densissime hirsutulis; floribus subcapitatis, minutis; sepalis spathulato-lanceolatis, extus longe hirsutis; petalo cyathiformi, glabro: racemo ♀ axillari, folio longiore, subimbricatim bracteato, aureo tomentoso; bracteis orbiculatis, parvis, fere sessilibus, flores pedicellatos circiter 8 fasciculatos celantibus; sepalo oblongo, utrinque attenuato, petaloque dimidio hreviore transversim ovato 2-nervi imo breviter unguiculato extus hirsutis; ovario hirsuto; stigmatibus latis, membranaceis; drupis hirsuto-tomentosis, bracteas æquantibus.—In Peruvia et Ecuador: v. s. in herb. DC. et Boissier, ♂ & ♀, Icaño, Rio Magdalena (Goudot); in hb. De Boiss. ♀, Peru (Pavon).

This species is remarkable for the golden-yellow dense hairy covering with which the whole plant is invested. Goudot's specimens from the province of Bogota agree with those of Pavon from Peru, and both accord with the ample description by Presl of Haenk's plant from Huanuco in Central Peru, where it is well known that Pavon made large collections. It approaches that

species, which differs in its more glabrous habit, its more triangular leaves, with more prominent and more branching nervures, a more rounded basal sinus, and stouter petioles: the inflorescence is different, the sepals and petals dissimilarly formed, and the style and stigma otherwise developed. The leaves are  $2\frac{3}{4}$  inches long,  $2\frac{1}{2}$  inches broad, with a basal sinus 3 lines deep, which comes to a sharp point near the petiole; they are of a light-green colour, of a soft texture, with the nerves and reticulated veins scarcely visible, with a golden fringe on the margin, and are covered beneath with a pale-yellow silky tomentum; the petiole is  $1\frac{1}{2}$  inch long, and inserted 1 line within the angle of the sinus: in the ♀ the leaves are somewhat smaller, the petiole is more slender, and of the length of, or longer than, the limb. The ♂ inflorescence assumes two forms in each axil, one to three panicles, dichotomously divided, about 1 inch long, with capillary peduncle and ramifications thickly set with yellow patent hairs, which give them the appearance of greater solidity; and these are accompanied by a young floriferous raceme-like branch, about 2 inches long, with somewhat distant axils, each furnished with an almost sessile velvety bract  $1\frac{1}{2}$ –2 lines in diam., and two or three fasciculated smaller panicles, about  $\frac{1}{2}$  inch long, diminishing upwards, where the flowers are aggregated in capitate heads; the flowers are very minute and extremely hirsute. The ♀ raceme is  $4$ – $5\frac{1}{2}$  inches long, with rather distant bract-like leaflets 2–3 lines in diam., and about eight fasciculated flowers in each axil, upon very short pedicels; all thickly hirsute, and of a golden colour: the sepal is somewhat lanceolate, the unguiculated petal less than half its length; the ovary is about the length of the petal, extremely hirsute, with a thick glabrous style about a third of its length, and three flattened, expanded, linear, membranaceous stigmata, obtuse or emarginate at their extremity. The very hirsute drupes, not quite matured, are 3 lines long, 2 lines broad.

21. *Cissampelos tomentosa*, DC. Syst. i. 535; Prodr. i. 101 (non H. B. K.);—C. Pareira, *Eichl. (non Linn.) l. c.* p. 189;—ramulis teretibus, valde tomentosis; foliis subpeltatis, orbicularibus, imo truncatis aut leviter cordatis, apice subemarginatis et mucronatis, marginibus crenulato-undulatis, coriaceis, 5–7-nerviis, supra plus minusve pubescentibus, subtus pallidioribus, dense cinereo vel flavo tomentosis; petiolo tomentoso, cum limbo geniculato, et illo dimidio brevioribus: paniculis ♂ axillaribus, solitariis aut geminis, petiolo vix longiore, 2–3-chotome ramosis, flavido tomentosis, cum ramulo novello foliolifero et florifero racemiformi duplo longiore simul ortis.—In Antillis et America meridionali: *v. s. in herb*

DC., Cuba (Linden, 1809); *in herb. Mus. Brit.*, Jamaica (Shakespear).

The above plants quite accord with DeCandolle's species from Campêche: all are scandent, and distinguished for their rather small, thick, and almost fleshy leaves, in which respect they differ from the plant described by Kunth under the same name. The axils are about  $1\frac{1}{2}$  inch apart; the orbicular leaves, densely clothed with thick yellowish tomentum, are generally crispately undulating on the margin,  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch in diam., with a stout petiole  $\frac{1}{2}$ –1 inch long, inserted barely 1 line within the basal margin. The very tomentose panicles are 1 inch long and broad, the peduncle being 5 lines long, and it becomes divided trichotomously into short branches, with a pedicellated small head of flowers in each sinus, the ultimate branches bearing a similar head of flowers; the floriferous raceme-like branch is  $1-1\frac{3}{4}$  inch long, with axils 3 lines apart, each axil producing a leaf-shaped petiolulated bract 2–5 lines in diameter, and one or two panicles 2–3 lines long.

22. *Cissampelos canescens*, Miq. Sert. Exot. 7, tab. 4; Walp. Rep. v. 17;—*Cissampelos* Pereira, *Eichl. (non Linn.) l. c.* p. 189;—ramulis gracilibus, sericeo pubescentibus; foliis subpeltatis, deltoideo-orbicularibus, cordatis, a medio sursum angustantibus, apice acutis vel obtusis, mucronatis, 5–7-nerviis, supra velutinis vel demum subglabris, subtus cano tomentosis; petiolo subtenui, pubescente, limbo brevior: paniculis ♂ axillaribus, interdum cum ramulo novello florifero folium superante racemiformi bracteolato comitatis: racemis ♀ axillaribus, solitariis vel binis, tenuiter elongatis, subflexuosis, folio 2–3-plo longioribus; bracteis subremotis, suborbicularibus, brevissime petiolulatis, mucronatis, sericeo tomentosis; floribus pedicellatis, 4–6 in axillis, fasciculatis.—In Mexico: *v. s. in herb. Hook. et Lindl.* ♀, Zimapan (Coulter, 659), Orizaba (Brotero, 569).

The above plant seems to correspond with the ♂ plant described by Miquel: its branches are very slender; the leaves are 12–17 lines long, 12–16 lines broad, with a basal sinus  $1\frac{1}{2}$ –2 lines deep, on a slender petiole 7–9 lines long, inserted  $\frac{1}{2}$  line within the margin. The ♀ raceme is  $3\frac{1}{2}$  inches long, with rounded tomentose bracts 2–3 lines apart and  $2-3\frac{1}{2}$  lines in diameter.

23. *Cissampelos glaucescens*, Tr. & Pl. l. c. 41;—*Cissampelos* Pereira, *Eichl. (non Linn.) l. c.* p. 189;—foliis vix peltatis, ovato-orbiculatis, basi leviter cordatis, apice obtusis vel emarginatis, mucronulatis, margine integro, rigide chartaceis, 5–7-nerviis, utrinque adpresse puberulis, subglaucescentibus:

racemis ♀ folio longioribus, minute bracteatis; bracteis flavosericeis, inferioribus petiolatis; floribus 4-6, fasciculatis; sepalo cuneato-oblongo, ovario longiore, petalum subsessile cuneato-quadratum concaviusculum intus glabrum superante; stigmatibus sessilibus, 3-partito; fructu orbiculato, compresso, parvo, seriatim tuberculato, parce puberulo.—In Ecuador ad La Mesa in Andibus Bogotensibus: *v. s. in herb. DC.* ♂, Chiquitos Bolivia (D'Orbigny, 774), Brasil. (Claussen); *in herb. Hook.*, Ecuador, La Paila (Horton).

This species, by the above authorities, is said to differ from others in the very small size of its bracts—a feature which I have shown to occur frequently. They found only the ♀ plant; but its floral characters, as above described, are those of ordinary occurrence. Its leaves are stated to be from  $9\frac{1}{2}$  to 13 lines long (2-3 centims.), its bracts scarcely 1 line long (2 millims.), its drupe  $1\frac{1}{2}$  line in diam. (3 millims.). As D'Orbigny's plant from Bolivia, Claussen's from Brazil, and Horton's from Ecuador agree with the short diagnosis of MM. Triana and Planchon, I have referred all of them to this species; they are, however, all ♂ specimens. The branches are very slender, the axils more or less approximated, the leaves in all suborbicular, subcordate, emarginate, and mucronate, puberulous above, cinereo-glaucous and pubescent below,  $9\frac{1}{2}$ -18 lines long, 12-22 lines broad, with a basal sinus 1-2 lines deep, the petiole 4-7 lines long, being inserted  $\frac{1}{2}$ -1 line within the margin: they have from two to five short panicles fasciculated in each axil, often accompanied by a longer floriferous raceme; the former are about 6 lines long, pilose, on a capillary peduncle dichotomously divided, with a pedicel in each dichotomy; the flowering branch, which looks like a female raceme, is  $1\frac{1}{2}$  inch long, with a somewhat flexuose rachis, having orbicular bracts 1-2 lines in diam., the axils about the same distance apart, bearing the nascent panicles. Horton's specimen, from nearly the same locality as the typical plant, is covered with short cinereous tomentum, with almost orbicular and obsoletely cordate leaves, 9-14 lines in diam., on a petiole 6-9 lines long.

24. *Cissampelos Guayaquilensis*, H. B. K. v. 67;—*Cissampelos* Pareira, *Eichl. (non Linn) l. c.* 189;—graveolens, ramis teneribus, striatis, glabris, junioribus cano tomentosis; foliis subpeltatis, suborbicularibus, imo truncatis aut paulo cordatis, apice profunde emarginatis et mucronatis, 5-7-nerviis, membranaceis, supra parce puberulis, subtus cinereo-glaucis et subpubescentibus, marginibus pilis flavidis dense ciliatis; petiolo tenui, subtomentoso, limbo æquilongus: paniculis ♂ axillaribus, 2-3, fasciculatis, trichotome divisis, pedunculo ramisque capillaribus pilosis; floribus capitato-approximatis:



racemo ♀ axillari, folio longiore, bracteato; bracteis vix imbricatis, suborbicularibus, fere sessilibus, pubescentibus.—In Ecuador et Antillis: *v. s. in herb. Mus. Brit., DC., et Hook.*, ♂, Guayaquil (Jameson, 335); *in herb. Hook.*, Guayaquil (Spruce, 6322); *in hb. Mus. Brit.* ♀, sine loco (Aublet); *in hb. DC.* ♀, Mexico (Pavon), Cuba (Pöppig).

The ♀ plants have all a different aspect, with more deltoid leaves; but I have referred them here, as they correspond pretty well with the type. They are all extremely slender climbers, with nearly orbicular leaves, almost glabrous above, more or less tomentose below, with a marginal fringe of yellow silky hairs; the leaves are 1–2 inches long,  $1\frac{3}{8}$ – $2\frac{1}{4}$  inches broad, on a very slender petiole  $\frac{3}{4}$ – $1\frac{1}{4}$  inch long, inserted 1 line within the margin; the ♂ panicles are  $\frac{3}{4}$  inch long, with short linear bractlets at their several ramifications; the ♀ raceme is  $\frac{3}{4}$ – $1\frac{1}{2}$  inch long, with bracts (scarcely imbricated) 2 lines in diam.: in the plant from Mexico the raceme is 2– $2\frac{1}{2}$  inches long, with bracts 3 lines in diameter.

25. *Cissampelos tamoides*, DC. Syst. i. 536; Prodr. i. 101; St. Hil. Fl. Bras. i. 55 (non Eichl.);—volubilis, ramulis tenuibus, teretibus, striatis, pubescentibus; foliis subpeltatis, deltoideo-orbicularibus, imo late cordatis, supra medium utrinque retusis et constrictis, apice obtusis, emarginatis et mucronatis, 7-nerviis, supra nitidulis, sparse pubescentibus, nervis flavidis immersis, subtus cinereo vel fulvido pubescentibus; petiolo subtenui, limbo brevior, flavido tomentoso: inflorescentia ♂ axillari, e ramulo novello racemiformi tomentoso, folio interdum longiore, imo foliolifero, superne bracteolato, paniculis 3, brevibus, in axillulis, fasciculatis, 3-chotomis; floribus minutis, congesto-corymbosis; sepalis 4, ovatis, utrinque acutis, apice mucronulatis, seriatim glanduloso-pictis, extus pilosis; petalo depresso-cyathiformi, tenuiter membranaceo, glabro: inflorescentia ♀ e ramulo novello axillari, in fructu folio longiore, ramis (racemis) longiusculis, subimbricatim bracteatis; bracteis parvis, foliiformibus, imo 5-floris; pedicellis apice bracteolatis.—In Brasilia; ♀ ad Contendas in Minas Geraës (St. Hil.): *v. s. in herb. Hook.* ♂, ins. S<sup>a</sup> Catharina (Tweedie).

Tweedie notes that this is a lofty climber, which densely covers the branches of the trees on which it grows, producing a dark shelter beneath them; the branches are slender and twining, with axils about  $1\frac{1}{2}$  inch apart; the leaves are 2– $2\frac{1}{4}$  inches long,  $2\frac{1}{4}$ – $2\frac{1}{2}$  inches wide, with a broad basal sinus 2 or 3 lines deep, on a petiole 1 inch long, inserted 1 line within the margin; the axillary ♂ floriferous branch is 1 inch long, doubtless becom-

ing longer, the two or three lower axils having young petiolated leaflets 2-9 lines broad, while the upper ones have bracts 1 line long; in each axil three short panicles, about 3 lines long, are fasciculated. St. Hilaire describes the ♀ plant only, and on comparing it with the original typical plant collected in Brazil by Desfontaines, he found they were identical, and equally corresponded with DeCandolle's description. What St. Hilaire describes as a ♀ raceme is, in fact, a young floriferous branch, the inferior ramifications of which, each issuing from a leaflet, consist of ♀ racemes in a young stage of growth; in this respect it is analogous to the ♂ inflorescence. The plant described by Dr. Eichler as *C. tamoides* is a different species, of which he figures the leaf and inflorescence: these correspond with other plants from the Amazonas region, *C. ramiflora*, the leaf of which is much larger, truncated or slightly cordate at base, not retusely sinuated at the sides, acuminate and acute at the apex; the inflorescence is also different.

26. *Cissampelos Australis*, St. Hil. Fl. Bras. i. 54;—*Cissampelos* Pereira, *Eichl. (non Linn.) l. c.* p. 189;—ramulis teneribus, glabriusculis; foliis vix peltatis, deltoideo-orbiculatis, imo subcordatis, sinu latissimo, infra summum sæpe retusim contractis, apice obtusulis et mucronatis, rarius emarginatis, coriaceis, 5-nerviis, nervis extus ramosis, supra viridulis, opacis, glabriusculis, subtus pallidioribus et pubescentibus; petiolo subtenui, striato, pilis ferrugineis retrorsis pubescente, limbo subæquilongus: paniculis ♂ axillaribus, 2 vel 3, fasciculatis, petiolo brevioribus pubescentibus, pedunculis apice breviter ramosis; ramis 4-6, approximatis, subumbellatim congestis, pedicellos plurimos alternos bracteolatos apice subumbellatim approximatos gerentibus; floribus numerosis, parvis, hinc corymbosis; sepalis ovatis, subacutis, extus pilosis; petalo depresso, cyathiformi, membranaceo, margine fere integro, glabro: racemis ♀ axillaribus, solitariis vel geminis, folio 2-3-plo longioribus, tomentosis, subremote bracteatis; bracteis suborbicularibus, breviter petiolulatis utrinque pubescentibus; floribus in axillis, 5-7, fasciculatis; ovario sericeo-piloso; drupis parvis, pilosis.—In prov. Argentinis: *v. s. in herb. Lindley, ♂, Uruguay (Tweedie); in herb. Hook. ♀, Uruguay (Tweedie, 1278).*

A somewhat slender climbing plant, with distinct characters. Its axils are  $1\frac{1}{2}$ -2 inches apart; the leaves are 2-2 $\frac{1}{4}$  inches long, 2 $\frac{1}{8}$ -2 $\frac{3}{8}$  inches broad, with a basal sinus 2-3 lines deep, on a petiole  $1\frac{1}{4}$ -1 $\frac{3}{4}$  inch long, inserted 1 line within the margin of the sinus. The ♂ panicles are  $\frac{3}{4}$ -1 inch long, on a peduncle 6-8 lines long, divided at its summit into very numerous, crowded, short

branches, again separating and bearing numerous closely alternate bracteolated pedicels, each with a minute flower, so that the whole forms a spreading corymbose head; the ♀ racemes have a tomentose slender rachis, about 5 inches long, with axils 2-3 lines apart; the bracts mostly are 2 lines in diam., a few of the lower ones measuring 4 lines; the pedicellated flowers are  $\frac{3}{4}$ -1 line long.

27. *Cissampelos monoica*, St. Hil. Fl. Bras. i. 55;—*Cissampelos* Pareira, *Eichl. (non Linn.)*, l. c. p. 189;—ramulis teneribus, striatis, subpubescentibus; foliis subpeltatis, exacte cordiformibus, lobis basalibus rotundatis, sinu obtusissimo, supra medium angustatis, apice obtusiusculis, 5-nerviis, supra pilosiusculis, subtus puberulis; petiolo gracili, subtus pubescente, supra canaliculato et glabro, limbo fere dimidio brevior: racemo ♂ axillari, composito, pedunculato, pubescente, bracteato; ramis filiformibus, bracteisque ovatis, parvis, acutis, petiolulatis, pubescentibus; pedicellis capillaribus: racemo ♀ axillari, breviter pedunculato, bracteato; rachi flexuosa, pubescente, fructifera folio longiore; bracteis cordatis, obtusis, longe mucronatis, supra glabris, subtus puberulis, imo pedicellos 5 unifloros pubescentes gerentibus; drupis coccineis, subpilosis, putamine generis.—In Brasilia meridionali, ad Curitiba, prov. S. Paulo.

The above diagnosis, which is very incomplete, is copied from St. Hilaire's account of a plant quite unknown to me. It may be presumed, from his description, that the male and female flowers are separated in distinct racemes upon the same plant, although he does not say so: in this respect it therefore differs from *Cissampelos ramiflora* and *C. consociata*, where flowers of both sexes are found in the same raceme. The leaves are stated to be 3 inches long, and of equal breadth, on a petiole 1-1½ inch long, inserted  $\frac{1}{2}$ -1 line within the margin. St. Hilaire did not see any of the male flowers, which had all fallen away; and of the female flowers only the ovaries remained. The ♀ raceme is above 4-5 inches long, with bracts 6 lines long, 7 lines broad; the pedicels in fruit 2 lines long; drupes 2 lines in diam.

28. *Cissampelos myriocarpa*, Tr. & Pl., Ann. Sc. Nat. sér. 4. xvii. p. 42; *Cissampelos* Pareira, *Eichl. (non Linn.)* l. c. p. 189;—ramulis teneribus, cano tomentosis; foliis subpeltatis, suborbicularibus vel deltoideo-ovatis, imo cordatis, apice rotundatis vel obtusis, mucronulatis, 7-nerviis, supra fuscis, nitidis, in nervis pilosulis, subtus thalassinio-vel cano-glaucis, pubescentibus, nervis venisque utrinque prominulis; petiolo tenui, limbo fere æquilongo, cano pubescente: racemis ♀ fructiferis

in axillis, 2-4, folio longioribus, longe divaricatim ramosis, ramis bracteola parva ovata petiolulata floribusque 4-10 pedicellatis donatis; pedicellis fertilium mox 6-plo longioribus; ovario piloso; stylo brevissimo; stigmatate breviter 3-dentato; drupis parvis, subglobosis, adpresse pilosis.—In Ecuador: *v. s. in herb. Hook.*, Las Mesitas (Triana).

This is a very distinct species, distinguished by the peculiarly expanded growth of its leafless fructiferous racemes and its copious drupes: in these respects it differs from *Cissampelos microcarpa*, which it resembles in the shape and size of its leaves; its petiole is, however, much longer. In the flowerless specimen the leaves are ovate, tapering gradually from the middle; in the floriferous branches they are nearly orbicular; the internodes are 2-2½ inches long; the leaves are 2½-4 inches long, 3-3½ inches broad, with a basal sinus 2-3 lines deep, on a slender petiole 2-2½ inches long, inserted 1 line within the margin of the sinus. The fructiferous racemes are 2-4 inches long, spreading to a breadth of 2 or 3 inches, and interlacing with each other, forming thus an expanding drupiferous network; the lateral branches are from 1 to 2½ inches in length, with leafless axils about 3 lines apart, from each of which a tomentose bract half a line long, and six to ten pedicellated flowers arise: the pedicels of these are only ½ line long; and seldom more than two or four of these flowers are fertilized, while sometimes as many as eight are matured, when the pedicels grow to a length of 2 lines, each supporting a nearly glabrous drupe 1½ line in diameter, thus giving an umbellate appearance to some of the axils of the raceme.

29. *Cissampelos auriculata*, nob.;—ramulis striatis, glabris; foliis subpeltatis, suborbicularibus vel obovatis, imo sinu profundissimo et angusto cordatis, lobis basalibus rotundatis, apicem versus angustioribus, obtusis, emarginatis et mucronulatis, 9-nerviis, supra in nervis sub lente pilosulis, subtus pallide glaucis, subpruinosis et in nervis pubescentibus; petiolo limbo dimidio brevior, retrorsum puberulo; panicula ♂ axillari, petiolum æquante, laxè et divaricatim divisa, 2-3-chotoma, pilosula, bracteis minimis, setaceis; ramis ultimis spicatum pedicellatis, simulque cum ramulo novello florifero racemiformi, folio vix longiore; rachi tomentosa; axillis inferioribus bractea parva foliiformi, superioribus bracteola donatis; sepalis 4, euncato ovatis, pallide membranaceis, extus pilosis; petalo cyathiformi, glabro, 4-plicato; anthera 4-loba: racemis ♀ binis, axillaribus, folium vix superantibus, ramuliformibus, pubescentibus; bracteis cordato-orbicularibus, petiolulatis, subremotis; floribus in axillis, 6, fasciculatis; sepalo spathu-

lato-oblongo, extus piloso; petalo dimidio brevior, late reniformi, breviter unguiculato, glabro; ovario piloso; stylo crasso, longiusculo; stigmatibus 3-lobis.—In prov. Argentinis: *v. s. in herb. Hook.* ♂ et ♀, Entre Rios (Tweedie).

This is a species very remarkable for its deep basal sinus, which extends to more than a third of the length of the leaf. Its internodes are  $1\frac{1}{2}$ –3 inches long; the leaves are 2–3 inches long, 2–2½ inches broad, with a basal sinus generally not more than 3 lines wide and 10 lines deep, the petiole ( $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long) being inserted  $\frac{1}{2}$  line within the margin of the narrow, rounded basal sinus. The ♂ panicle is 1 inch long, the thread-like peduncle being 6 lines long; the raceme-like floriferous branch is  $1\frac{1}{2}$  inch long, its axils 3–4 lines apart; the lower bracts 1 line in diam., the upper setaceous bracteoles  $\frac{1}{4}$ – $\frac{1}{2}$  line long; each panicle is dichotomously divided, with a solitary pedicel in each sinus, the ultimate rays being spicated. The ♀ raceme is 2–3½ inches long, the reniform bracts, 3–4 lines apart, 4 lines long, 5 lines broad, becoming shorter upwards; the pedicels are  $\frac{1}{2}$  line, the ovary  $\frac{1}{4}$  line, the sepal  $\frac{1}{2}$  line, the petal  $\frac{1}{4}$  line long.

30. *Cissampelos hederacea*, nob.;—ramulis tenerrimis, striatis, subglabris; foliis supeltatis, parvis, deltoideo-cordiformibus, imo sinu latissimo profunde cordatis, lobis basalibus rotundatis, apice obtusiusculis et emarginatis, 5–7-nerviis, supra sub lente brevissime puberulis, subtus pallidioribus et fulvoglaucis, subpuberulis; petiolo tenui, limbo dimidio brevior, pubescente: paniculis ♂ binis, axillaribus, petiolo triplo vel dimidio brevioribus, pubescentibus, alternatim brevissime ramosis, ramis divisim ramulisque bractea minima setacea donatis; sepalis 4, ovatis, margine crenulatis, extus pilosis; petalo depresso, cyathiformi, integro, glabro; anthera 4-loba.—In prov. Argentinis: *v. s. in herb. Hook.* ♂, forsitan ex Entre Rios (Tweedie).

A species of ivy-like growth, remarkable for its small, triangular, deeply cordate leaves: it much resembles the African *Cissampelos tamnifolia*, from Delagoa Bay, from which it differs in its more pubescent, larger, and less acute leaves, and in its very dissimilar inflorescence. The axils are about  $1\frac{1}{2}$  inch apart; the leaves are  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long,  $1\frac{1}{2}$ – $1\frac{5}{8}$  inch broad, with a very wide hollow sinus 3–5 lines deep, on a slender petiole 6–9 lines long, inserted 1 line within the margin of the sinus; the sides, from the middle towards the summit, are nearly straight; they seem glabrous to the naked eye, but under a lens are slightly puberulous. The ♂ panicles are 3 lines long, the peduncle being

half that length, and are remarkable for their alternate subdivision, forming an almost capitate head of very minute flowers.

31. *Cissampelos argentea*, H. B. K. v. 67;—*Cissampelos* Pareira, *Eichl. (non Linn.) l. c.* p. 189;—ramulis filiformibus, striatis, incano hirsuto tomentosis; foliis subpeltatis, subrotundato-reniformibus, apice emarginatis et brevissime mucronatis, membranaceis, 7-nerviis, supra viridibus, pubescentibus, subtus argenteo sericeo tomentosis; petiolo filiformi, villosa, limbo æquilongus: paniculis ♂ axillaribus, geminis, cymosis, petiolo brevioribus; pedunculo 3-4-ramoso, ramis radiatis, dichotome divergentibus, bracteolatis, pedicellis que capillaribus pilosis.—Prope Mompox, Rio Magdalena.

From Kunth's description, this species seems to approach *Cissampelos canescens*; but it differs in its leaves being membranaceous, broader than long, reniform, and not cordate at the base, also in their silvery pubescence, their very slender petiole of equal length, and in the leaf-like bracts of its cymose panicles. The leaves are  $1\frac{1}{4}$ - $1\frac{1}{2}$  inch long,  $1\frac{1}{2}$ - $1\frac{3}{4}$  inch broad, on a petiole  $1-1\frac{1}{2}$  inch long. The ♂ panicle, at the apex of the peduncle where its branchlets radiate, have two suborbicular bracts on very short petiolules, pubescent above, sericeous beneath,  $3\frac{1}{2}$  lines, diminishing gradually to  $\frac{1}{2}$  line in diam.; the branchlets also have minute linear bracteoles; the sepals are cuneately obovate and extremely pilose.

32. *Cissampelos subreniformis*, Tr. & Pl. Ann. Sc. Nat. sér. 4. xvii. p. 41;—*Cissampelos* Pareira, *Eichl. (non Linn.) l. c.* p. 189;—ramulis teretibus, dense flavo tomentosis; foliis subpeltatis, junioribus fere palatis, orbicularibus, imo sinu angusto profunde cordatis, apice emarginatis et mucronulatis, 7-nerviis, coriaceis, reticulatis, supra sericeo pubescentibus, subtus dense flavido tomentosis, marginibus lanatis; petiolo breviusculo, subvalido, striato, dense tomentoso: panicula ♂ axillari, tomentoso-pilosa, folio brevioribus; pedunculo breviusculo, ramis pluribus, alternis, brevibus, multoties divisis; floribus numerosissimis, hinc in capitula majuscula crebre aggregatis, pilosis: racemis ♀ solitariis vel geminis, folio brevioribus; bracteis paucis, floribus brevioribus et haud conspicuis; floribus dense fasciculatis; pedicellis ovario paulo longioribus; stigmatibus fere sessilibus, bipartitis.—In Ecuador et Brasilia centrali: v. s. in herb. Mus. Brit. et Hook., Douro, prov. Goyaz (Gardner, 3002).

I have here considered Gardner's specimen as the ♂ of M. Triana's plant, which I have not seen; for it agrees well in the form and size of its coriaceous leaves, their vestiture, and the

shortness of its racemes—characters which, according to Planchon, entitle it to rank as a distinct species. It approaches *C. argentea* in the size and form of its leaves, but differs in its much thicker branches, in its coriaceous (not membranaceous) leaves, in their pubescence, their much shorter and stouter petiole, and in the want of the large leaf-like bracts in its cymose panicles. The axils in Gardner's specimens are  $1\frac{1}{2}$  inch apart, the very orbicular velvety leaves are  $1\frac{3}{8}$ – $2\frac{1}{4}$  inches long, including the very narrow basal sinus 3–4 lines deep; they are  $1\frac{1}{2}$ – $2\frac{1}{4}$  inches broad, on a stout petiole only 3–8 lines long, which is inserted 1 line within the margin of the sinus. The ♂ axillary inflorescence, on a short stout rachis, is  $\frac{3}{4}$ –1 inch long, intricately spreading to about the same breadth, throwing out several closely alternate ramifications, commencing 3 or 4 lines from the base, which are immediately divided repeatedly, the whole forming a large irregular capitate head of innumerable minute flowers; the petals are obovate, and pilose outside. In M. Triana's ♀ plant it is stated that the leaves are  $9\frac{1}{2}$ –13 lines (2–3 centims.) long; its floral bracteoles 1 line (2 millims.) long, its drupe  $1\frac{1}{2}$  line (3 millims.) in diameter.

33. *Cissampelos andromorpha*, DC. (non Eichl.) Syst. i. 539; Prodr. i. 102; Deless. Icon. i. tab. 99;—*Cissampelos denudata*, nob. in *Kew Journ. Bot.* iii. 115; *Walp. Ann.* iv. 130;—*Cissampelos fasciculata*, *Benth. Lond. Journ. Bot.* ii. 361; *Eichl. in Mart. Fl. Bras.* fasc. 38. 194, tab. 46;—*Cissampelos Caapeba*, *Vell. (non Linn.) Fl. Flum.* x. tab. 139;—alte scandens, ramulis inferioribus aphyllis, sæpe longe radicantibus, sulcato-striatis, glabris, nodis floriferis; superioribus foliiferis, retrorsum ferrugineo pubescentibus; foliis fere palatis, deltoideo-orbiculatis vel ovatis, basi truncatis aut bisinuatis, vel cordatis, apice obtuse rotundatis, emarginatis et mucronatis, marginibus ciliatis, submembranaceis, 7-nerviis, supra fusco-opacis, subpuberulis, subtus pallidioribus, thalassinio- vel brunneo-glaucis, puberulis, præsertim in nervis tenuibus sæpe flexuosis et paulo prominulis; petiolo tenui, elongato, striato, limbo æquilongo vel longiore, cinereo pubescente: racemis ♂ in ramis aphyllis annotinis pluribus fasciculatis, in ramulis axillaribus et solitariis vel pluribus; rachi elongata, tomentosa, ebracteata, folium multo excedente; axillis sparsis, singulis bracteolam minimam tomentosam cymulasque 3 fasciculatas proferentibus; pedunculo capillari, puberulo, alternatim brevissime ramoso; ramis minime bracteolatis, flores paucos pedicellatos spicatim gerentibus; sepalis cuneato oblongis, sæpius glabris; petalo turbinato-campanulato, 4-sulcato; anthera 4-loba: racemis ♀ in axillis aphyllis annotinis 2–5

fasciculatis, axillis ebracteatis, approximatis, singulis flores circiter 5 pedicellatos gerentibus, vel rarius ipsis ad apicem pedunculi brevissimi fasciculatis; ovario villosa; drupis ovatis, subglabris.—In Brasilia et Guiana: *v. viv.* ♂ in montibus Organensibus: *v. s. in herb. DC.* ♂, Bahia (Blanchet, 3947); *in herb. Lindley*, ♂ & ♀, Bahia (Salzmann); *in herb. Hook.* Rio de Janeiro (M'Gillivray, 297), Guiana Brit. ♂ et ♀ (Schomb. 677), Guiana Gall. (Sagot, 18); *in herb. meo* ♂, Obidos, Santarem, Rio Trombetas (Spruce); ♀, Santarem (Spruce); Veraguas (Seemann, 1156).

The plant collected by me in the Organ Mountains, and that in Bahia by Blanchet, quite correspond with that figured in Delessert's *Icones* and described by DeCandolle, so as to leave no doubt in my mind as to their identity. The plant described and figured by Dr. Eichler as *C. andromorpha* is very different, as the above diagnosis shows. Turpin's drawing in the *Icones* is a correct representation of the ♀ inflorescence as seen in Salzmann's specimen.

The species is peculiar in the character of its ♂ inflorescence, in which respect it offers some analogy to *C. australis* and the preceding species. The diameter of the floriferous stem in my specimen is 4 lines, that of the leaf-bearing branch 1 line, with internodes 2 inches long; the leaves are remarkably dull and of thin texture, 3 inches long, 3 inches broad, the slender petiole (3–3½ inches long) being inserted ¼ line or only just within the margin. The rachis of the ♂ raceme is 4½–5 inches long, thickly tomentose, having, at intervals of 2 to 4 lines, a fascicle of two to six cymules, 2½–4 lines long; eight or ten minute flowers appear in a panicular form on the summit of each of its three very short rays; the pedicels are ½ line, the sepals ½ line long, the petal half that length. In Blanchet's Bahia specimen the leaves are 3¾–4 inches long, 3½–4 inches broad, with a broad basal sinus 3 lines deep; those of Salzmann's plant are smaller. About fifteen ♀ racemes are fasciculated in the aphyllous nodes of the older branch, each 2–3 inches long; the rachis is bare of flowers in its lower moiety, above which are numerous approximated axils, each bearing a linear minute bracteole and about seven fasciculated flowers: in some of them the fasciculated flowers are borne upon a very short peduncle.

I have referred here my *C. denudata*, which differs in little except its more cordate leaves; its inflorescence and flowers are quite in accord. It is called *Amboa-rembú* by the natives, and is remarkable for its long, straggling, radican, aphyllous, and floriferous branches. The leaves are 2–2¾ inches long, 2¼–2½ inches broad, with a basal sinus 3 lines deep, and on a petiole



$1\frac{1}{2}$ – $2\frac{1}{2}$  inches long. The ♂ raceme is about 8 inches long, with a filiform rachis, which, at distances of  $\frac{1}{2}$  an inch, throws out a minute bract and three or four fasciculated cymules 4–6 lines long, dichotomously divided and minutely bracteolated. The ♀ racemes are 3– $4\frac{1}{2}$  inches long, wanting the usual foliiform bracts, as in all the other specimens the drupes are 4 lines long. I have also placed in the same species *C. fasciculata*, Bth., the leaves of which and male racemes agree in all respects with those of Spruce's plant from Obidos.

34. *Cissampelos ramiflora*, nob.;—*Cissampelos andromorpha*, Eichl. (non DC.) in *Martius Fl. Bras.* fasc. 38. p. 195, t. 44. fig. 3;—ramis subangulatis, sulcatis, subglabris; ramulis flexuosis, striatis, subpuberulis; foliis obsolete peltatis aut fere palatis, deltoideo-ovatis, imo vix cordatis, vel potius circa petiolum subito plus minusve profunde bisinuatis, apice sæpe valde acutis et cuspidato-mucronatis, 5-nerviis nervoque marginali revoluta, utrinque sub lente puberulis, supra opace viridibus, transversim venosis et reticulatis, subtus flavescenti-glaucis, nervis tenuibus, paulo prominulis; petiolo tenui, limbo paulo brevior, striato, puberulo: racemis ♂ supra-axillaribus, solitariis vel geminis, folio 2–3-plo longioribus, ebracteatis, rachi gracilissima, subpubescente, axillulis subremotis, bracteola minima acuta tomentosa cymulisque 3 fasciculatis munitis; vel alternatim ramosis, ramis longiusculis distantibus, imo minime bracteolatis, axillulis approximatis, bracteola cymulisque 3 brevibus donatis; omnium pedunculo ramulisque capillaribus, subpilosus; pedicellis imo bracteolatis, crebre spicatis, pedicellis floribusque glabris; sepalis obovatis, glanduloso-pictis; petalo turbinato: racemis ♀ monoicis, supra-axillaribus, petiolum subæquantibus, flavido puberulis, alternatim ramosis; ramis divaricatis, imo bractea parva foliiformi, superne bracteolis linearibus acutis decrescentibus munitis, axillulis flores pedicellatos 4 ♂ et 2 ♀ fasciculatos gerentibus bracteolaque minima munitis: in ♂ sepalis 4, pilosis; petalo glabro, poculiformi, sæpe in laciniis 2–3–4 inciso; anthera 4-loba: in ♀ sepalo piloso, bracteolis 3 consimilibus cincto; petalo latissimo, glabro, sæpius in laciniis 2–3–4 plus minusve profunde inciso; ovario dorso piloso, paulo gibbo.—In Brasilia septentrionali: *v. s. in herb. variis* ♂, Rio Casiquiare (Spruce, 3165), prope Panuré, Rio Uaiupes (Spruce, 2463); *cum fl. monoic.* San Gabriel, Rio Negro (Spruce, 2166).

I cannot agree with Dr. Eichler in referring the above plants to *C. andromorpha*, DC.; for they do not accord either with Turpin's drawing of its ♀ inflorescence or with DeCandolle's

description, in which respects the plants I have referred to that species tally admirably. Dr. Eichler gives a correct sketch of the ♀ inflorescence; but he does not seem to have noticed the existence of ♂ flowers intermixed with ♀ and their preponderance in the same fascicle, which is not surprising where the flowers are so very minute. There is something unusual in the incised state of the petal in the male flower, though it is sometimes entire; but the condition of the ♀ flower is altogether abnormal, where four pilose scales form the external envelope, appearing like four distinct sepals; but I have considered only one of them to be the sepal, and the three others encircling bracts: the petal, always open on one side and sometimes entire, is frequently incised into two, three, or four segments, which do not extend to the base. This species has many points of resemblance to *C. andromorpha*, but is certainly very distinct. The leaves are  $2\frac{1}{4}$ – $4\frac{3}{4}$  inches long,  $1\frac{3}{4}$ – $3\frac{3}{4}$  inches broad, on a petiole  $1\frac{3}{4}$ – $2\frac{1}{2}$  inches long. The rachis of the ♂ racemes is 6–8 inches long, with axils 4–6 lines apart, and the branches, when present, are  $1\frac{1}{2}$  inch, diminishing to 3 lines in length; the peduncles 2–3 lines long, with branches half that length; the pedicels  $\frac{3}{4}$  line long; the sepals cuneately oblong, 1 line long, with hyaline margins, and dark in the middle, with glandular patches; the turbinate petal is 1 line long, with the stamen included. In the ♀ raceme the rachis is stouter, shorter, about  $2\frac{1}{2}$  inches long, with branches about  $\frac{1}{2}$  inch long, the petiolulated leaf-like bracts being about 2 lines long.

35. *Cissampelos floribunda*, nob.;—ramulis fuscis, striatis, obsolete pilosis; foliis vix subpeltatis, amplis, late obovatis, imo cordatis, apice rotundatis et emarginatis, 5–7-nerviis, supra glaberrimis, subnitidis, aut in nervis obsolete puberulis, reticulatis, subtus cinereo-glaucis, subpuberulis, nervis venisque reticulatis, nigrescentibus et nitidis; petiolo tenerrimo, limbo subæquilongo: paniculis ♂ axillaribus, solitariis vel geminis; petiolo paulo brevioribus, e basi late divaricatim ramosissimis; ramis iterum sæpe divisis, floribundis, ferrugineo pubescentibus; sepalis cuneato-ovatis, extus pilosis; petalo turbinato, margine integro, glabro.—In Peruvia: *v. s. in herb.* DC. ♂, Peruvia (Pöppig).

A very distinct species, with large orbicular leaves, somewhat like those of *C. Caapeba*, but differing in being more glabrous, of thinner texture, otherwise shaped at base, with a more slender and longer petiole: it is very dissimilar in its peculiar inflorescence, both ♂ and ♀. The leaves are 3–4 inches long,  $2\frac{3}{4}$ – $4\frac{3}{4}$  inches broad, with a basal sinus, in the ♂, 3–5 lines deep;

in the ♀, where they are truncated at base, there is a sinus on each side of the petiole  $1-1\frac{1}{4}$  line deep; the very slender petiole is  $3\frac{1}{4}-3\frac{1}{2}$  inches long. The three fasciculated ♂ panicles are 4 lines long; the peduncle, 3 lines long, bears on its summit three subulate tomentose bracteoles  $\frac{1}{2}$  line long, and about twelve pedicels, each 1 line long, thus forming an umbel of very minute flowers. The ♀ raceme issues from a hairy tuft about a line above the insertion of the petiole, and is  $1\frac{1}{2}-2$  inches long, with many short divaricate ramifications 3-4 lines apart and 3-4 lines long, quite deficient of the ordinary leafy bracts: these branchlets bear from three to six pedicellated flowers, the ovary being adpressedly pilose; the raceme is altogether pubescent.

\*\*\* Folia palata aut subpalata; plantæ scandentes.

36. *Cissampelos Caépéba*, Linn. Sp. 1473; Willd. Sp. iv. 863; DC. Syst. i. 536; Prodr. i. 101; Plum. Amer. i. 56, tab. 67. fig. 2 (non Vell.);—*Cissampelos eriocarpa*, Tr. & Pl. Ann. Sc. Nat. 4 sér. xvii. 40;—*Cissampelos Pareira*, Hook. & Th. (non Linn.) Fl. Ind. i. 198; Eichl. (non Linn.) in Mart. Fl. Bras. l. c. 188;—ramulis teretibus, torto-striatis, pilis patentibus rufulis aut ochraceis vestitis; foliis palatis aut obsolete pel-tatis, suborbicularibus, basi sinu sæpe angusto profunde cordatis, apice emarginato-rotundis, vel paulo angustioribus, mucronatis, marginibus subrevolutis, 7-9-nerviis, crassiusculis, supra subnitidis, sparse pilosulis, subtus pallidioribus, crebre ochraceo pubescentibus; petiolo limbo fere æquilongo vel longiore, valido, imo torto et tumidulo, summo longe incrassato, pilis flavidis aut rufulis patentibus dense piloso: paniculis ♂ axillaribus, 2-3 fasciculatis, petiolo 3-4-plo brevioribus aut æquilongis, patentim pubescentibus, ramis subumbellatis 3-4, iterum divisis, hinc floribus dense corymbosis; cum altera e ramulo novello simul orta comitatis, petiolo æquilonga, spicatum ramosa, undique tomentosa, axillulis approximatis, bractea parva paniculisque 2 consimilibus sed multo brevioribus munitis, undique tomentosus, floribus numerosis, minutis, corymbosis, in capitulum aggregatis; sepalis oblongis, vix acutis, carnosulis, extus pilosis; petalo depresso cyathiformi, lineis guttatis radiatim picto, fere glabro; anthera 4-loba, subinclusa: racemo ♀ axillari, folio multo longiore, imbricatim bracteato, pubescente; bracteis reniformi-orbiculatis, brevissime petiolulatis, imo 6-10-floris; pedicellis brevibus, fasciculatis; ovario villosus; drupis longiuscule pedicellatis, ochraceo vel rufo pilosis.—In Antillis et America intertropica: v. s. in herb. DC. ♂, Peru (Pöppig, 1293); in hb. Hook. ♂, Tarapota (Spruce, 4409); Chonana, Guayaquil

(Spruce, 6538); *in herb. De Boissier et Hook.*, Mexico (Pavon), Peru (Pavon).

This is a very decided and original species, recognized by Linnæus and generally by botanists as being essentially different from *C. Pareira*; but these two species and most others of the genus have been fused into a single one by the authors of the 'Flora Indica' and by Dr. Eichler. If two such extreme forms are to be regarded as identical, upon the principle of ignoring the differential characters which separate them, then of course no other species except *C. Pareira* can be maintained in the genus, as the former botanists have explicitly shown (Fl. Ind. i. 200): to be equally consistent, the same system should be followed in all the other genera, so that all the plants of the family would thus be reduced to single species in every genus. It is clear that either we must admit the validity of specific differences, according to the method established by botanists, or we must ignore such differences upon the singular reason laid down by the authorities above referred to. The moment, however, that any second species is admitted, the whole of this very simple system falls to the ground. This has happened to Dr. Eichler in his attempt to diverge a little from the extreme doctrine above cited, which he had embraced: he was evidently not aware, as my diagnoses of the species demonstrate, that the sectional characters on which he based, as exemptions, eight other Brazilian species of *Cissampelos* with long descriptions, are applicable to a great number of long-established species which he fuses into *C. Pareira*. A little careful observation will show that no such middle course can be followed consistently, and that there is no other way of escaping from the dilemma except by returning to the methods universally followed by every other botanist.

Plumier's figure of the ♀ plant of *Cissampelos Cáapeba*, collected in St. Domingo, is a good representation of the specimens I have seen from other localities, and his description, as far as it goes, is correct. I have not seen the *C. eriocarpa* of MM. Triana and Planchon, collected by the former in the Cordillera of Bogota; but the characters given of it quite correspond with the above diagnosis, drawn from the Peruvian and Mexican specimens. All the plants are more or less densely covered with spreading reddish or yellow villous hairs; the leaves are  $3\frac{1}{4}$ – $4\frac{1}{2}$  inches long,  $3\frac{3}{4}$ – $4\frac{1}{2}$  inches broad, with a basal sinus  $\frac{3}{4}$ –1 inch deep; the densely villous petiole, inserted on the margin of the blade in continuity with the midrib, is 2 inches long in Spruce's specimen, and  $3\frac{1}{2}$  inches long in Pöppig's. In Pavon's plant the leaves are somewhat smaller, less orbicular;

the petiole more slender and as long as the blade. In Pöppig's specimen the ♂ panicles spring from the axils of the larger leaves; in Spruce's they are on a separate and younger branch, where the young leaves are only 1-1½ inch in diameter; in both cases the panicles are covered with a reddish-yellow villosity; they are 1-1½ inch long, much branched and spreading, the ultimate pedicels being 1½ line long; the sepals are ½ line long, very pilose; the petal is ½ line in diameter, much depressed, and slightly hairy outside. The ♀ raceme is 5 inches long; the bracts 6-9 lines in diam., 2-3 lines apart; the drupes, covered with reddish hairs, are 2 lines in diam., supported on a pedicel of the same length.

Var. *biloba*;—foliis majusculis, orbiculatis, imo sinu angusto profundissime cordatis, lobis basalibus valde rotundis, supra nitidis, sub lente pilosulis, subtus tomentosus; petiolo limbo æquilongo aut longiore, imo tumidulo subito refracto: racemo ♂ e ramulo novello, petiolo æquilongo, axillulis bractea parva cymulisque 3 brevibus donatis; pedunculis e ramis confertis, apice sæpius pseudo-umbellatis:—*v. s. in herb. De Boissier et Hook.* (ex hb. Pavon), ♂, Guayaquil (Pavon).

A very distinct variety, which with many botanists, and perhaps with reason, would claim specific rank, owing to its deeply cleft leaves, their longer petiole, and its inflorescence.

37. *Cissampelos consociata*, nob.;—monoica, ramulis teretibus, striatis, subpuberulis; foliis fere palatis, cordato-orbicularibus, apicem versus angustatis, apice obtusis et mucronulatis, 7-nerviis, supra viridibus, nervis venisque pallidis, glabris, subtus sordide glaucis, puberulis; petiolo tenui, limbo paulo brevior, glabro, apice pubescente: racemo ♂ et ♀ supra-axillari, tomentoso, folio paulo longiore; rachi subtenui, flexuosa, subimbricatim bracteata; bracteis suborbicularibus, subcordatis, apice aristato-mucronatis, subglabris; petiolulo brevissimo, piloso; axillulis superioribus paniculas ♂ 4 racemosas vix pilosas bractea paulo longiores gerentibus, inferioribus flores ♀ 5 pedicellatos fasciculatos emittentibus; pedicellis petiolulo vix longioribus, pilosulis: in ♂ sepalis 4, ovalibus, pallidis, extus pilosis; petalo cyathiformi, glabro: in ♀ sepalo late oblongo, extus pubescente; petalo orbiculari, dimidio brevior, glabro; ovario piloso; stylo longiusculo, subtenui, stigmatibus reflexis.—In Antillis: *v. s. in herb. Hook.* ♂ & ♀, Jamaica (Wilson).

This plant much resembles the preceding in the size and shape of its leaves and the mode of insertion of the petiole, but they are more cordate; the form of its inflorescence is very different.

This plant was of extreme interest to me, as it was the first instance I had seen of regular monœcious flowers in the family. St. Hilaire described his *C. monoica*; and though I have much faith in the accuracy of his observations, I always doubted the reality of his plant being truly monœcious, as he did not see the male flowers, and only inferred their existence. In the plant under consideration the branches are slender, with axils about 3 inches apart; the leaves are  $3\frac{1}{2}$  inches long,  $3\frac{1}{2}$  inches broad, with a basal sinus 4 lines deep, the petiole being  $2-2\frac{1}{4}$  inches long, inserted  $\frac{1}{4}$  line within the margin, so that it may be said to be palatte. The axillary racemes are about 6 inches long, with proximate bracts 3 lines long,  $3\frac{1}{2}$  lines broad, which grow smaller towards the extremity of the raceme; they are borne on petiolules  $\frac{1}{2}$  line long. There are four ♂ panicles fasciculated in each of the upper axils, borne on peduncles 4-5 lines long, with several short, alternate, 1-flowered pedicels  $\frac{3}{4}$  line long; while the ♀ flowers, in a bundle of five pedicels, each about 1 line long, are always seen fasciculated in the lower axils, the sepal being  $\frac{1}{4}$  line long.

38. *Cissampelos diffusa*, nob.;—ramulis teretibus, striatis, fere glabris; foliis palatis, suborbiculatis, imo cordatis, vel subtruncatis et latissime bisinuatis, apice rotundiusculo emarginatis et mucronatis, submembranaceis, supra viridulis, nitidiusculis, haud puberulis, marginibus sæpe ciliatis, subtus griseo-glaucis, adpresse subpilosis, nervis fuscis nitidulis paulo prominulis; petiolo tenui, limbo paulo brevior, striolato, puberulo: inflorescentia ♂ axillari, e ramulo novello racemiformi, petiolum vix excedente; axillis remotiusculis, bracteola parvula sericea paniculisque 2 geminatis munitis; paniculis bi-trichotome divisis, cum pedicello in dichotomiis, fere glabris, capillaribus; sepalis obovatis, glabris.—In Antillis: *v. s. in herb. Hook.* ♂, in Antillis? (Gouan); ♂, Jamaica (Wilson).

This species approaches *C. Caapeba*, but it differs in its leaves not being deeply cordate, in being almost glabrous, in their slender petioles, and in its inflorescence. It resembles *C. consociata* in the shape of its leaves, their more slender petiole, but differs in its diœcious flowers and a more simple form of inflorescence. The leaves are  $2\frac{1}{2}-3\frac{1}{2}$  inches long,  $3-3\frac{1}{2}$  inches broad, the depth of the sinus on each side of the petiole being scarcely a line (when cordate, the sinus is 3 lines deep); the petiole is  $2-2\frac{1}{2}$  inches long; the inflorescence is nearly 3 inches long; the ♂ panicles are  $1-1\frac{1}{2}$  inch long, 1 inch broad; the peduncle 9 lines, the primary rays 3 lines, the secondary 2 lines long.

\*\*\*\* Erectæ; folia palata, rarius subpeltata.

39. *Cissampelos crenata*, DC. Syst. i. 537; Prodr. i. 102; Benth. Lond. Journ. Bot. ii. 361;—*Cissampelos ovalifolia*, Eichl. (*non DC.*) in Mart. Fl. Bras. fasc. 38. 187;—caule erecto, simplici, crassiusculo, stricto, striato, flavido tomentoso; foliis erecto-adpressis, ovato-orbiculatis (in ♀ ovalioribus), apice obtusissime rotundatis, emarginatis et mucronatis, gradatim minoribus et acutioribus, imo vix cordatis, marginibus sinuato-crenatis et dense lanatis, subcoriaceis, 5–7-nerviis, supra fusco-opacis, molliter pubescentibus, subtus cinereo tomentosis; petiolo in ♂ præsertim brevissimo, crassiusculo, flavide tomentoso, limbo 18–24-plo brevior: paniculis ♂ 3, fasciculatis, axillaribus, subcorymbosis; pedunculo tomentoso, petiolo 8-plo longiore, apice alternatim ramoso, ramis brevibus, pilosulis, corymboso-plurifloris; pedicellis floribusque minutis, fere glabris; sepalis 4 (rarius 5–8 in duplici serie), spatulato-ovatis, margine crenulatis; petalo cyathiformi: racemis ♀ binis, folio subæquilongis vel longioribus; bracteis subimbricatis, orbiculatis, subsessilibus, tomentosis; floribus in axillulis, fasciculatis.—In Brasilia et Guiana: *v. s. in herb. variis*, ♂ & ♀, Guiana (Schomburgk, 124).

This species appears confined to Guiana and northern Brazil; it much resembles *C. ovalifolia* in the hue and texture of its leaves, but differs in their more orbicular form, usually deeply crenated margin, and in their still shorter petiole. It is a plant growing in arid savannas, apparently of very low stature, with a simple erect stem 2 lines thick, and with axils  $\frac{3}{4}$ – $1\frac{1}{4}$  inch apart; the leaves in the ♂ are  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch broad, on a petiole 1 line long; in the ♀ they are 2– $2\frac{1}{2}$  inches long,  $1\frac{3}{4}$ – $2\frac{1}{4}$  inches broad, with a thick petiole 1 line long; two or three ♂ panicles, about 1 inch long, are fasciculated in each axil, the pilose peduncle,  $\frac{3}{4}$  inch long, being alternately ramified, with extremely short branches, on which the corymbose minute flowers are approximated in a subcapitate head. There is a disposition to deformity in the flowers, which have sometimes an additional sepal, or two flowers are metamorphously combined, thus showing eight or fewer sepals in a double series, with one or two petals and stamens. The ♀ racemes are about  $1\frac{1}{2}$  inch long, the bracts being 3 lines in diameter.

40. *Cissampelos mallophylla*, nob.;—radice tuberculoso-nodosa, caulibus in ♂ e basi geminis, erectis, simplicibus, dense flavo lanatis, in ♀ caule solitario, humiliore, flavo lanato, ad medium nudo, dehinc in ramos 3 erectos subæquales diviso; foliis in utroque sexu similibus, suborbicularibus vel deltoideo-

orbicularibus, imo truncatis aut obsolete cordatis, apice obtusiusculis, emarginatis, mucronatis, sursum gradatim minoribus et acutioribus, coriaceis, 7-nerviis, utrinque densissime tomentosis, supra pilis flavidis, subtus fulvis vel canescentibus, marginibus creberrime fimbriato-ciliatis et rufescentibus; petiolo brevissimo, crasso, tomentoso, limbo 8-plo brevior: paniculis ♂ axillaribus, 2-3, fasciculatis, brevissimis, flavido pilosis, pedunculo petiolo vix longiore; floribus numerosis, corymbosis, in capitulum approximatis; sepalis spatulato-ovatis, extus villosis; petalo cyathiformi, glabro: inflorescentia ♀ e ramis terminalibus racemiformi; floribus 6, pedicellatis, in axillis foliorum superiorum bracteiformium fasciculatis; ovario villosissimo.—In America intertropica: *v. s.* ♂ & ♀ in herb. *DeCandolle.*

It is now more than twelve years since I saw specimens of both sexes, I think from the herbarium of Prof. De Candolle or M. de Boissier, who then most kindly sent for my inspection all their Menispermaceous plants. I have preserved the drawings of these plants and the characters then observed; in this instance, however, the names of the locality and collector were omitted to be noted; but, if my memory does not fail, they were sent by Goudot either from New Granada or Venezuela. The root in both sexes is knotty and tuberculose: in the ♂ plant it throws out two erect stems 15-18 inches high, 2 lines thick, and flexuose at their extremity; the ♀ plant altogether is not more than 8 inches high; the main stem, 2 lines thick, at the height of 4 or 5 inches emits three axillary erect branches 3-4 inches long. In the ♂ plant the axils are 1 inch apart; the extremely velvety leaves are 2-2½ inches long, 1¼-1½ inch broad, on a petiole 2 lines long; these gradually diminish in size upwards till they are not more than 4 lines in diameter, and all are floriferous; the panicles are only 3 or 5 lines long. In the ♀ plant the lower leaves are three or four about the origin of the floriferous branches; they are 15-18 lines long, 16-20 lines broad, on a petiole of 2 lines; and the branches have each a leaf or two of similar size at their base, whence they become rapidly smaller, at intervals of ¼ of an inch, assuming the appearance of imbricated orbicular and nearly sessile velvety bracts from 6 to 3 lines in diameter, all very tomentose.

This species is extremely different from *C. vestita*, and distinct from all others.

41. *Cissampelos ovalifolia*, DC. Syst. i. 537; Prodr. i. 102; St. Hil. Pl. Us. tab. 34; Fl. Bras. i. 51; Eichl. (in parte) in Mart. Fl. Bras. l. c. 187;—*Cissampelos subtriangularis*?, St. Hil. l. c. 52; Echites dubia, *Vell. Fl. Flum.* 114. iii. tab. 50;—



radice tuberosa; caulibus erectis, simplicibus, solitariis vel pluribus, subtetragonis, tomentosis; foliis ovatis, imo rotundatis aut truncatis, rarius subcordatis, apice obtusis vel acutis, mucronatis (superioribus minoribus), marginibus subintegris aut plus minusve crenatis, adpresse imbricatis, coriaceis, 5-7-nerviis, nervis rectis, extus valde ramosis, supra molliter subpilosis, reticulatis, subtus pallidioribus, cinereo tomentosis, nervis prominulis; petiolo brevi, tomentoso: pauculis ♂ axillaribus, 2-3, fasciculatis, petiolo triplo longioribus, pilosulis, subcorymbosis; pedunculis tenuissimis, ramisque ebracteatis, pedicellis bracteola minima donatis: racemo ♀ imbricatum bracteato; bracteis foliolosis, orbicularibus, tomentosis; floribus 5, brevissime pedicellatis, in axillulis fasciculatis; sepalo obovato, denticulato, unguiculato, petaloque orbiculari dimidio brevioribus extus pilosis.—In Brasilia, prov. Minas Geraës et Goyaz (St. Hil.): *v. s. in herb. meo*, ♂, Ceará (Gardner, 1445 *bis*); *in herb. DC.* ♂ & ♀, Cuyaba; *in herb. Hook.* ♂, Entre Rios (Tweedie).

This species is found principally in the upland campos of the central provinces of Brazil, and extends as far south as the territory of Uruguay, everywhere growing in the pasturages, where it is called *Orelha de Onça*, and is much used as a febrifuge. It may be recognized by its thick, subcoriaceous, elliptic leaves, with prominent and nearly parallel or slightly divergent nervures, which are externally branched and tend straight to the margin, terminating in the sinus of each crenature; they are rounded and truncated at base in the ♂, and obtusely narrowed or rarely cordate at base in the ♀, and palately fixed upon extremely short petioles. It differs from *C. crenata* in its more oblong or elliptic leaves, obsoletely crenated or entire on the margins, and other characters. Its simple stem, bare of leaves at its base, rises to the height of 1 or 2 feet; its subimbricated leaves, about 1 inch apart, are  $1\frac{1}{2}$ - $3\frac{1}{2}$  inches long,  $1\frac{1}{4}$ -2 inches broad, on a petiole 3 lines in the ♂, and 2 lines long in the ♀; they are of a pale dull green above, and covered beneath with short ashy-grey tomentum. The ♂ peduncle is 5-6 lines long, trichotomously divided; the sepals are spathulately oblong, sparsely pilose outside; the ♀ raceme is  $1\frac{1}{2}$  inch long, its bracts 4-5 lines in diam.; the drupes are ovate, compressed, and very pilose, the putamen being 4 lines long and 3 lines broad.

There is no essential difference between the above diagnosis and that of St. Hilaire's *Cissampelos subtriangularis*, except that the leaves are somewhat smaller. Tweedie's specimen from Entre Rios quite accords with the latter: this is a ♂ specimen, while

St. Hilaire's specific character was founded on a ♀ plant. Velloz's figure is a good representation of the species, with leaves somewhat broader than usual.

Dr. Eichler, in adopting the extreme views of the authors of the 'Flora Indica' in regard to *Cissampelos*, has made an exception to their rule, by acknowledging this species to be distinct from *C. Pareira*, although he fuses into it all the other species with erect stems, together with two scandent plants which bear no relation to it whatever. The ground on which this species, so amplified, is acknowledged is not its erect and non-scandent habit and diminutive height (characters not regarded by Dr. Eichler as of any specific value), but solely because he attributes to it (including other plants which he considers to be synonymous) an herbaceous stem. This is a feature I cannot allow them to possess; nor does St. Hilaire, a most observing botanist, who noted the characters of this very species as well as *C. ebracteata* at the place of their growth, and he distinctly describes both as having a suffruticose erect stem. In respect to *C. Hænkeana* and *C. hirsutissima*, which Dr. Eichler includes in this species, Presl describes the one as being "*fruticosus et volubilis*," and the other as a "*frutex volubilis*." I may also add that M. Triana does not attribute an herbaceous stem to his *C. vestita*, also included in this species by Dr. Eichler. This botanist has no more substantial reason for amalgamating all the erect species with *C. ovalifolia* than he has for absorbing in *C. Pareira* the long list of well-established species which he quotes as its synonyms.

There is one peculiarity in all these erect species, which does not seem to be generally known: they are never seen in the forests, where nearly all the scandent species are produced; those of Brazil are confined to the upland districts, where they grow in sterile grassy plains; those of Guiana and the countries to the north of the Amazonas appear in arid savannas. One of the prominent features, which serves to mark them specifically, is the comparative length of the petiole, in which respect the eight species here enumerated may be divided into three sections:—1. where the petiole is extremely short, not exceeding 3 lines in length, embracing *C. crenata*, *mallophylla*, *ovalifolia*, and *communis*; 2. where it is of median length, from 4 to 6 lines, as in *C. velutina* and *vestita*; and 3. where the petiole is longer than 6 lines, as in *C. suborbicularis* and *Amazonica*.

42. *Cissampelos communis*, St. Hil. Fl. Bras. i. 52, tab. 11;—*Cissampelos ovalifolia*, Eichl. (non DC.) l. c. p. 187;—caule erecto, simplici, rufo tomentoso; foliis ovatis, imo truncatis, apice obtusiusculis vel subacutis, mucronatis, in ♀ majoribus,

rhombeo-ellipticis, apice subacuminatis, mucronatis et ad imum angustum subcordatis, 5-7-nerviis, nervis rectis, extus ramosis, supra pubescentibus, subtus cinereo tomentosus; petiolo brevissimo, limbo 8-16-plo brevior: racemo ♂ axillari, e ramulo novello folio brevior, alternatim bracteato; bracteis late ovatis, integris mucronulatis, gradatim minoribus, singulis paniculis 3 fasciculatis comitatis; pedunculo brevissimo; floribus numerosis, in caput aggregato-corymbosis; sepalis obovatis, unguiculatis, obtusissimis, extus villosis; petalo cyathiformi, glabro: racemis ♀ axillaribus, 1-3, fasciculatis; folio multo brevioribus, pedunculatis, sæpe recurvis, imbricatim bracteatis; bracteis ovatis, acutis, breviter petiolulatis, supra pilosis, subtus rufo villosis; floribus breviter pedicellatis 6, in axillulis fasciculatis; sepalo ovato, unguiculato, extus vix piloso; petalo dimidio brevior, transversim ovali, unguiculato, glabro; ovario dorso villosissimo.—In Brasilia, prov. S. Paulo.

I have not seen this plant. In the extreme shortness of its petiole it approaches the preceding species; the leaves are somewhat different in form; and in the peculiar character of its ♂ inflorescence it is at variance with all others of this section. The plant is only 18 inches high, and is found growing in grassy plains in the upland districts of one of the southern provinces of Brazil; its leaves are about  $\frac{1}{2}$  inch apart, and erect; in the ♂ they are  $1-1\frac{3}{4}$  inch long,  $\frac{3}{4}-1\frac{1}{4}$  inch broad, on a petiole 2 lines long: in the ♀ they are 2-3 inches long,  $1-1\frac{1}{2}$  inch broad, on a petiole of 2 lines. The ♂ raceme is about  $1\frac{1}{2}$  inch long, with three or four alternate axils, each with an acute obovate bract, 4 lines long, 2 lines broad, and an almost sessile and nearly capitate head of flowers of the same length; the ♀ raceme is only  $\frac{1}{2}$  inch long, imbricately crowded with rufescent bracts, 3 lines long, 1 line broad, and each concealing a fascicle of six minute flowers, on pedicels  $\frac{1}{2}$  line long, the sepal being 1 line in length.

43. *Cissampelos velutina*, St. Hil. Fl. Bras. i. 52;—*Cissampelos ovalifolia*, Eichl. (*non DC.*), l. c. p. 187;—caulibus simplicibus, solitariis vel pluribus, erectis, rufescente lanatis; foliis in utroque sexu orbicularibus, vel orbiculari-ovatis, imo rotundatis vel paulo cordatis, apice obtusissimis, emarginatis et mucronatis, superioribus minoribus, cuneato-obcordatis et acutioribus, 5-7-nerviis, coriaceis, valde reticulatis, venis prominentibus, supra subglabris vel paulo pubescentibus, subtus pallidioribus, pilis rufo-cinereis, velutino tomentosus; petiolo subbrevis, limbo 6-10-plo curtiore, rufo lanato: paniculis ♂ axillaribus, 4, fasciculatis, petiolo vix longioribus, ebracteatis,

villosis; floribus numerosis, corymbosis; sepalis extus villosis: racemis ♀ axillaribus, binis, folio æquilongis; bracteis remotiusculis, reniformi-orbiculatis, tomentosis.—In Brasilia et Venezuela: *v. s. in herb. Mus. Brit.* ♂, Minas Geraës (Claussen); *in herb. Hook.* ♀, Tovar, Venezuela (Fendler, 1890); *in herb. meo*, Caraccas.

This species differs from *C. ovalifolia* in the orbicular shape of its leaves, their more velvety covering, and their longer petiole; from *C. vestita* for the same reasons and the very different form and size of the leaves in the ♂ plant. It is probably the *C. rotunda* of Pohl, a manuscript name given to a plant of his collection, which is perhaps identical with Claussen's specimen. The axils are scarcely  $\frac{3}{4}$  inch apart; the leaves, somewhat divaricating, sometimes refracted, are 2–2 $\frac{3}{4}$  inches long, 2 $\frac{1}{4}$ –2 $\frac{1}{2}$  inches broad, on a stout petiole, geniculated on the margin of the blade; the capillary peduncle of the panicle is 6 lines long, and bears three to five short, approximated and almost umbellate rays, with numerous corymbose pedicels  $\frac{1}{2}$  line long; the sepals, 1 line long, are spatulately obovate and obtuse, the cup-shaped petal one-third that length, all pilose outside. The ♀ raceme is 2 inches long, with membranaceous orbicular bracts, truncated at base, round at the apex, 3 lines apart, 4–5 lines broad, 3–4 lines long, on a petiolule  $\frac{3}{4}$  line long, each with about four fasciculated very small flowers; ovary very villous; the stigmata are short, divaricated, and with the style, glabrous.

This and all the kindred erect species are known in Brazil by the name of *Orelha de Onça* (Tiger's ear); in the Spanish regions they are called *Oreja de Burro* (Ass's ear), not Bull's ear, as it is translated in Mart. Fl. Brasiliensis.

44. *Cissampelos vestita*, Tr. & Pl. Ann. Sc. Nat. sér. 4. xvii. p. 44; —*Cissampelos ovalifolia*, *Eichl. (non DC.) l. c.* p. 187;—caule erecto, stricto, crassiusculo, dense tomentoso; foliis palatis, adpresse imbricatis, in ♂ rhomboideo-ellipticis, utrinque obtuse angustatis, apice acutioribus et cuspidato-mucronatis, in ♀ deltoideo-orbicularibus, vel late ovatis, basi truncatis aut subcordatis, apice subacutis, obtusis et mucronatis, 5–7-nerviis, nervis in ♂ rectis, subparallelis, extus ramosis, in ♀ divaricatis et geniculatis, supra crebre pilosis, subtus densissime flavo tomentosis, marginibus lanato fimbriatis, in ♂ integris, in ♀ subcrenatis; petiolo crasso, breviusculo, tomentoso, limbo in ♂ 12-plo, in ♀ 8-plo brevior: paniculis ♂ axillaribus, 3, fasciculatis, petiolo paulo longioribus; pedunculo tenuissimo, apice pluriramoso, ramis brevissimis, 1–2-floris; floribus corymbosis; sepalis fuscis, spatulato-ovalibus petaloque cyathiformi extus villosis: racemis ♀ axillaribus, solitariis,

folio brevioribus, tomentosis, imbricatim bracteatis; bracteis orbicularibus, mucronatis, subsessilibus, extus tomentosis; floribus fasciculatis circiter 6; ovario villosissimo; stylo glabro, apice breviter 3-dentato; drupis pilosis.—In Venezuela et Nova Granada: *v. s. in herb.* Hook. ♂ & ♀, Tovar (Funke, 171); ♀, Serra Nevada de S<sup>a</sup> Martha (Purdie).

In size and venation the leaves of the ♂ plant of this species bear some resemblance to those of *C. ovalifolia*, especially in their peculiar nervation; but they differ in their more rhombic form, their more attenuated base, and their stout cuspidate apex: they differ altogether in their shape and venation in the female plant, where they are orbicularly ovate, obtusely narrower towards the summit, broadly rounded, and either truncated or cordate at base, and less entire on the margin: in both sexes they are covered with a denser tomentum. The stem is 2 lines thick, its axils 1–1 $\frac{3}{4}$  inch apart; the leaves in the ♂ are 3 $\frac{3}{4}$  inches long, 2 $\frac{1}{4}$  inches broad, with a very stout curved petiole 4 lines long; in the ♀ they are 2 $\frac{1}{4}$ –3 $\frac{1}{4}$  inches long, 2–2 $\frac{1}{4}$  inches broad, either truncated at base or cordate, with a sinus sometimes 2 lines deep, the petiole being also 4 lines long. The ♂ panicles are about 4 lines long, their branches  $\frac{1}{2}$ –1 line, all very pilose. The ♀ raceme is 1–1 $\frac{1}{2}$  inch long, the bracts 4–6 lines in diam., with petioles 1 line long; the drupe is 2 $\frac{1}{2}$  lines long.

45. *Cissampelos suborbicularis*, St. Hil. Fl. Bras. i. 53;—*Cissampelos ebracteata*, St. Hil. l. c. 53; *Pl. Us.* tab. 35;—*Cissampelos assimilis*, nob. in *Kew Journ. Bot.* iii. 114;—*Cissampelos ovalifolia*, Eichl. (non DC.) l. c. p. 187;—caulibus solitariis vel geminis, erectis, simplicibus, angulato-striolatis, rufo vel ochraceo tomentosis, internodiis longiusculis; foliis suborbicularibus vel orbiculato-ovatis, summum versus repandis vel crenatis, apice emarginatis et cuspidato-mucronatis, superioribus minoribus ovatis et acutis, 7-nerviis, nervis extus longe ramosis, supra opacis et rufo puberulis, reticulatis, subtus cinereo tomentosis; petiolo longiusculo, in ♂ limbo dimidio (in ♀ 4-plo) brevior, subtenui, erecto, patentim molli-ter piloso, limbo palatim et geniculatim affixo: paniculis ♂ axillaribus, 3–4, fasciculatis, petiolo æquilongis; pedunculo pilosissimo, apice ramoso, ramis brevibus; floribus corymbosis vel subcapitato-approximatis; sepalis spathulatis, extus pilosis; petalo cyathiformi, 4-sulcato, glabro: inflorescentia ♀ terminali, floribus 5, in axillis supernis fasciculatis, pedicellatis, minimis.—In Brasilia, ♂, prov. Minas Geraës (St. Hilaire); ♀ sub *C. ebracteata*, Minas Geraës (St. Hilaire): *v. s. in herb. meo* ♂, prov. Amazonas, 'prope Santarem (Spruce); *in herb.*

*Hook.* ♂, Douro, prov. Goyaz (Gardner, 2999), Ceará (Gardner, 1445 *bis*).

This is easily distinguished from all its allied species by its very long and erect petioles, geniculated upon very rounded leaves: its petiole approaches that of the following species, but is longer and palately (not peltately) fixed upon the blade. The root is nodose, sometimes throwing out two stems: these are erect, 15–20 inches high, and  $1\frac{1}{2}$  line thick; the leaves, in the ♂, are 1–3 inches apart,  $1\frac{1}{2}$ –2 inches long,  $1\frac{1}{8}$ – $1\frac{3}{4}$  inch broad, on a somewhat slender, very erect petiole 10–15 lines long. The very slender peduncles, about 6 lines long, have three alternate branches 3 lines long, each bearing a head of subcorymbose minute flowers. I have referred here the *C. ebracteata* of St. Hilaire as the ♀ plant of this species, as it agrees in the form of its leaves, their tomentose covering, and in the greater length of their petiole. This plant differs from all others of this section in the absence of the usual raceme-like ♀ inflorescence in the axils of its leaves; the pedicellated flowers are fasciculated at the origin of the petioles of the superior leaves only, just as they are placed in the axils of what are considered bracts in the ordinary raceme; and in this point of view the ♀ inflorescence here is a terminal raceme, with leaves instead of bracts. We find this occurring also in *C. Amazonica*; but in that species there is at the same time a superabundance of the ordinary flowering racemes, there being three in each main axil instead of the ordinary single one: a similar mode of ♀ inflorescence is found in *C. mallophylla*. The leaves are orbicular oval or broadly elliptic, subacute, cinereo-tomentose beneath,  $2\frac{1}{2}$  inches long, 2 inches broad, on a slender petiole 6 or 8 lines long; the pedicels are  $1\frac{1}{2}$  line long; the spatulately oblong sepal, pubescent outside, is  $\frac{1}{3}$  line long; the minute orbicular petal, one-fourth of that length, is scarcely visible.

46. *Cissampelos Amazonica*, nob. Kew Journ. Bot. iii. 114; Walp. Ann. iv. 131;—*Cissampelos ovalifolia*, var. *cinerascens*, *St. Hil. Pl. Us.* tab. 34; *Fl. Bras.* i. 52;—*C. ovalifolia*, *Eichl. (non DC.) l. c.* p. 187;—caule erecto, simplici, subtetragono, tomentoso; foliis (præsertim in ♂) subpeltatis, in junioribus palatis, ovalibus vel ovatis, imo rotundatis aut truncatis vel levissime sinuatis, apice obtusis, emarginatis et cuspidato-mucronatis, superne gradatim minoribus, 7-nerviis, nervis rectis, paulo divergentibus, extus valde ramosis, ad marginem terminantibus, coriaceis, supra nitentibus, reticulatis, ad nervos prominulos scabrido-pilosulis, subtus ferrugineo pilosis vel tomentosis; petiolo longiusculo, subtenui, limbo 4-plo bre-

viore, crebre pilosulo: paniculis ♂ axillaribus, 3, fasciculatis, pilosis, ebracteatis; pedunculo tenuissimo, petiolum vix æquante, apice breviter bis dichotome diviso, cum pedicello in dichotomiis, ramis ultimis alternatim crebre pedicellatis; sepalis sæpius 5, spathulato-ovatis, fuscis, extus pilosis; petalo cyathiformi, margine sub-5-lobo, membranaceo, glabro; antheris 4-6, sæpius 5: racemis ♀ axillaribus, sæpius 3, fasciculatis, uno petiolum æquante, alteris 2-3-plo longioribus, imbricatim bracteatis; bracteis orbicularibus, mucronatis, submembranaceis, reticulatis, breviter petiolulatis, subtus rachique tomentosa pilosis; drupis majusculis, pilosis.—In Brasilia, prov. Pará: *v. s. in herb. meo et alior.*, prope Santarem (Spruce).

This species bears much resemblance to *C. ovalifolia* in the size, shape, and venation of its leaves; these differ, however, in their more oval form, their upper surface being very shining and scabrid to the touch, and in having a much longer petiole, which, in the ♂ plant especially, has a decidedly peltate insertion: the ♂ racemes are fasciculated, not solitary, in each axil. In the ♂ plant the leaves are 2-2½ inches long, 1½-1¾ inch broad, quite of an oval form, with a petiole 7-9 lines long, inserted 2 lines within the basal margin; in the ♀ they are 2½-3 inches long, 2-2½ inches broad, more ovate, on a petiole 5-7 lines long, inserted ½ line within the margin; their nervation is as in *C. ovalifolia*; the ♂ panicles are 7 lines long: the ♀ racemes, three out of each axil, are severally 1, 2, 3 inches long; the terminal portion of the main stem, where the leaves become gradually smaller until they are reduced to the size of the bracts, assumes in consequence the appearance of the axillary racemes, the leaves or bracts being nearly orbicular, ½-1 inch in diameter, on a petiolule 2-5 lines long, and having a fascicle of three to four pedicellated flowers at the base of each.

## 2. AFRICANÆ.

\* Folia peltata; frutices scandentes.

47. *Cissampelos Owariensis*, Beauv., DC. Prodr. i. 100;—ramulis teneris, teretibus, striatis, glabris, rugulosis; foliis peltatis, suborbicularibus, imo sinuato-cordatis, ultra medium utrinque repandis, apice rotundiusculis, hoc modo fere trilobatis, lobis lateralibus apicalique obtusis et aristato-mucronatis, 12-nerviis, supra viridibus, nitentibus et pilis sparsis adpressis puberulis, reticulatis, subtus cano-vel thalassino-glaucis, in nervis venisque pilosiusculis; petiolo glabro, limbo brevioris vel æquilongo: inflorescentia ♂ axillari, racemiformi vel pseudo-spicata, petiolo

sublongiore; rachi dense pubescente, bracteata; bracteis vix imbricatis, reniformi-orbiculatis, petiolulatis, aristato-mucronatis; membranaceis, subglabris, margine longe piloso-ciliatis; ramis cum bracteis enatis binis, iis paulo longioribus, corymbosis; floribus pro genere majusculis; pedicellis imo bracteolatis; sepalis spathulato-oblongis, apice subacutis, marginibus crenulatis, extus molliter pilosis; petalo turbinato-campanulato, extus piloso, margine crenulato, subtetralobo; anthera tetraloba, inclusa: racemo ♀ e ramo novello axillari, folio longiore, imo foliis paucis et tot quot ramulis donato; ramulis imbricatis bracteatis; bracteis subreniformibus, cordatis, apice profunde emarginatis et aristato-mucronatis, brevissime petiolulatis, membranaceis, reticulatis, subglabris, marginibus longe ciliatis; floribus 5, pedicellatis, in axillis fasciculatis, tomentoso-pilosis.—In Africa æquinoctiali: *v. s. in herb. Mus. Brit.* ♂, Cape Coast (Brass); *in hb. Lindl.* ♀ (P. de Beauvois); *in herb. Hook.* ♀, Niger (Baxter, 3345), Lagos (Baxter, 20156); Fernando Po (Mann, 180).

Palisot de Beauvois did not live to complete his 'Flora Owarriensis,' or this species would have been described and figured in that work; De Candolle, however, gave a short and incomplete account of the typical specimen in Delessert's herbarium, evidently the female plant only, though no mention is made of this, —a supposition confirmed by the existence of a duplicate ♀ specimen in Dr. Lindley's herbarium: the plant above enumerated from Cape Coast is, without doubt, the ♂ of the same. The species is easily recognized by its nearly 3-lobed orbicular leaves, each lobe being marked by an excurrent aristiform point, which is sometimes broken off; the inflorescence in both sexes also offers peculiar characters. The leaves in the ♂ plant are  $2\frac{1}{2}$  inches in diameter, on a petiole  $1-1\frac{1}{4}$  inch long, inserted 5 lines within the margin of the shallow marginal sinus: those in the ♀ plant, though of similar form, are larger, and upon longer petioles; they are  $2\frac{3}{4}-3\frac{3}{4}$  inches long, 3-4 inches broad, on a petiole  $1\frac{1}{2}-2\frac{3}{4}$  inches long, inserted 5-8 lines within the margin of the sinus. The ♂ racemiform spike may be compared to a young floriferous branch with dwarfed leaves; it is  $1\frac{1}{2}-3$  inches long, its membranaceous bracts being closely approximated, subsessile, more or less cordate at base, deeply emarginated and with an aristate point in the apex, and 2-3 lines in diameter; the panicles in the axils of each of these bracts are 3-5 lines long, corymbose, subpilose, with very slender peduncles and pedicels, the latter being 1 line long, and the very acutely oval bracteoles  $\frac{3}{4}$  line long; the sepals are  $1\frac{1}{2}$  line long, lanceolate, with crenulated margins, and externally pilose; the petal is 1 line long. The ♀ raceme is 3-4 inches long, and emits two or three alternate



branches near its base; each branch, springing from the bottom of a bract-like membranaceous leaflet 10 lines in diameter, is imbricately covered with orbicular, almost sessile, membranaceous bracts 2-3 lines in diameter, which are glabrous, though ciliated on the margin with long rufous hairs; the pedicels are 1 line long; the sepal is 1 line long, oblong, unguiculated at base, obtuse at summit, crenulated on the margin, fuscous, and sparsely pilose outside; the petal is orbicular, crenated, and less than half the length of the sepal, externally pilose; the ovary, with a long style and trifid stigma, is altogether only  $\frac{3}{4}$  line long.

48. *Cissampelos insolita*, nob.;—ramulis teneris, striatis, fusco-brunneis, glabris; foliis peltatis, deltoideis, imo orbiculatis et paulo cordatis, ultra medium subito sinuato-attenuatis et acuminatis, 9-11-nerviis, supra nitidis, glaberrimis (in nervis vix pilosulis), valde reticulatis, subtus luride pallidioribus, opacis, brevissime pubescentibus, nervis teneris, prominentibus; petiolo tenui, subpiloso, limbo brevior: panicula ♂ axillari, solitaria, e basi spicato-ramosa, petiolo longiore, flavide pubescente; rachi gracili, ramis capillaribus, subremotis, 2-3, fasciculatis, apice breviter dichotome iterum divisis, e bracteola parva ortis; floribus parvis, fere glabris; sepalis cuneato-orbiculatis; petalo depresso-cyathiformi; anthera tetraloba.—In Africa tropicali: *v. s. in herb. Hook.* ♂, Corisco Bay (Mann, 1870).

This species is well distinguished from the preceding by its very glabrous habit, its shining leaves sharply acuminate at the apex, and by its raceme-like ♂ inflorescence, deficient of the peculiar imbricated bracts which mark *C. Owariensis*, and with petals and a corolla of very different shape. It forms a shrub 6 feet high, with very slender scandent branches, whose axils are 4 inches apart; the leaves are  $3\frac{1}{2}$ -4 inches long,  $3\frac{1}{4}$ - $3\frac{1}{2}$  inches broad, on a petiole 2- $2\frac{1}{4}$  inches long, which is inserted 4 lines within the margin of the broad basal sinus, 2-3 lines deep. The raceme-like inflorescence is 3 inches long, with a straight slender rachis clothed with yellow pubescence; two or three capillary fasciculated branches issue at intervals of 3-5 lines out of a small bracteole, the capillary peduncles being 3-4 lines long and dichotomously divided twice or thrice, with a sterile pedicel in each furcation; the flowers are small and nearly glabrous.

49. *Cissampelos hirta*, nob.;—ramulis pilis longis mollibus hirtis; foliis peltatis, late deltoideo-ovatis, imo cordato-truncatis, marginibus sinuatis vel integris, apice obtusis et mucronatis, e basi 7-9-nerviis, supra viridibus, subglabris, sparse pilosis, subtus cano-glauciscentibus, pilosis, in nervis venisque pilis

flavidis patentibus densius hirtis; petiolo crebriter et patentim longe hirto, limbo fere æquilongus: racemo ♀ axillari, solitario, spicato, imbricatim bracteato, hirto, petiolo æquilongus; bracteis orbicularibus, hispido-pilosis; flores 4–7 fasciculatos celantibus.—Ad fluvium Congo: *v. s. in herb. Mus. Brit.* ♀, Congo (C. Smith).

A species between *C. Owariensis* and *C. Zairensis*, remarkable for its leaves less peltate than the former, and clothed with copious, villous, long, patent, yellow hairs, which also invest the petioles and branches; the leaves are  $4\frac{1}{4}$  inches long,  $4\frac{1}{4}$  inches broad, on a petiole  $2\frac{3}{4}$  inches long, inserted 4 lines within the margin of the basal sinus, which is 2 lines deep. The slender pilose raceme is 3 inches long; the almost glabrous bracts, with very long ciliate margins, are 2 lines in diameter, very membranaceous, and reticulated.

\*\* Folia subpeltata; frutices scandentes.

50. *Cissampelos Zairensis*, nob.;—ramis compressis, angulato-striatis, pallidis; ramulis flexuosis, cinereo tomentosus, striatis; foliis subpeltatis, deltoideo-ovatis, imo profunde cordatis, apice obtusis, aristato-mucronatis, subcoriaceis, marginibus sub-revolutis, 7–9-nerviis, supra viridulis, fere glabris, subtus cano-glauciscentibus et tomentosus; petiolo refracto, tomentosus, limbo brevior: racemo ♂ axillari, solitario, spicato, axillis remotiusculis, aphyllis, hinc floribus numerosis minimis, sessilibus, glomerato-aggregatis, sæpius heteromeris; sepalis rarius 4, plerisque 5 vel 6, obovatis, extus tomentosus; petalo minimo, discoideo, crenulato, glabro; anthera brevissime stipitata, petalo latiore, 10–12-locellata, annulari: racemo ♀ axillari, folio longiore, tomentosus, ramos elongatos emittente; ramis spicatis, flexuosis, bracteatis (bracteis parvis, ovatis, aristatis, sessilibus, reflexis, internodiis brevioribus), floribus 6–10 fasciculatis fere sessilibus donatis; drupis glabris.—In Africa occidentali: *v. s. in herb. Mus. Brit.*, river Congo, ♂ et ♀ (C. Smith).

This species is remarkable not only for its very tomentose leaves, less peltate than any of the preceding, but also for the very unusual form of its inflorescence and its heteromerous ♂ flowers. The leaves, similar in both sexes, are  $3\frac{1}{8}$  inches long,  $2\frac{3}{4}$  inches broad, on a petiole  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long, inserted  $1\frac{1}{2}$  line within the margin of the somewhat acute sinus, which is 2–3 lines deep. The ♂ raceme is 2– $2\frac{3}{4}$  inches long; its leafless axils,  $\frac{1}{2}$ – $\frac{3}{4}$  inch apart, bear a sessile agglomerate head of very numerous minute flowers, the heads being 2–3 lines in diameter. The ♀ raceme is 5–6 inches long, with several lateral branchlets  $1\frac{1}{2}$  inch

long, with axils 3 lines apart; the reflected bract in each is  $1\frac{1}{2}$  line long,  $1\frac{1}{4}$  line broad, the almost sessile flowers  $\frac{3}{4}$  line long, all covered with a dense cinereous tomentum; the drupes are 2 lines long,  $1\frac{1}{2}$  line broad.

51. *Cissampelos Madagascariensis*, nob.;—ramulis scandentibus, cinereo-tomentosis vel subglabris; foliis majoribus, subpeltatis, deltoideo-orbiculatis, imo profunde cordatis, sinu angusto rotundato, summum versus angustioribus, apice obtusis, emarginatis et aristato-mucronatis, 7–9-nerviis, submembranaceis, supra opace viridibus, sparse pubescentibus, subtus canoglaucis et molliter pubescentibus, junioribus fusco-tomentosis; petiolo refracto, striato, tomentoso, limbo fere æquilongus: paniculis ♂ 3, axillaribus, fasciculatis, petiolo dimidio brevioribus, longiuscule et tenuiter pedunculatis, trichotome divisis, puberulis; sepalis cuneato-ovalibus, extus pilosis; petalo cyathiformi, depresso, glabro, subintegro; anthera tetraloba: racemo ♀ axillari, spicato; bracteis parvis, foliaceis, cordato-orbiculatis, mucronatis, complicatis, tomentosis; floribus pedicellatis, 6–9, in axillis fasciculatis; ovario piloso; stigmatibus divaricatis, fere sessilibus.—In insulis Madagascar et Bourbon: *v. s. in herb. Mus. Brit.*, Madagascar (Thompson); *in herb. De Cand.* ♂, Bourbon (ex hb. Linn. fil.); *in herb. De Boissier*, Bourbon (e Mus. Par.); *in herb. Hook.* ♂ & ♀, Madagascar, (Blackburn).

This species may be recognized by the large size of its nearly orbicular leaves, with a deep rounded basal sinus, upon elongated petioles, and by the shortness of its spicated ♀ racemes. The leaves in the Madagascar specimens are 5–5½ inches long, 5–5½ inches broad, on a petiole 4 inches long, inserted  $1\frac{1}{2}$  line within the margin of the narrow rounded basal sinus, which is 9–11 lines deep. In the Bourbon plants they are 4 inches long, 4 inches broad, on a petiole  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches long, the basal sinus being nearly 1 inch deep. The ♂ panicles are 1–1¼ inch long, the filiform peduncle 9 lines long, the primary branches 3 lines, the secondary 1 line, and the pedicels short; the flowers are small, the sepals nearly orbicular, and marked with oblique interruptedly dotted lines, and pilose outside. The axillary ♀ racemes are 3 inches long, with a slender rachis furnished with bracts springing from the base upwards at intervals of about 3 lines, which are 2–3 lines in diameter, and each encloses six flowers upon long pedicels, which lengthen considerably with the growth of the ovaries; in the lower axil of the specimen there is a similar raceme, 10 inches long, upon a slender rachis naked towards the base, which at the distance of  $1\frac{3}{4}$  inch throws out a leaf 2 inches in diameter, on a petiole  $2\frac{1}{4}$  inches long, and at a fur-

ther distance of an inch beyond that it terminates in a bracteated raceme like those just described; it is, in fact, a young branch terminated by a raceme.

52. *Cissampelos Bojeriana*, nob.;—ramulis striatis, subpuberulis; foliis subpeltatis, ovatis vel suborbicularibus, sinu sat profunde cordatis, apice paulo angustioribus, retusis et longe aristato-mucronatis, 7-nerviis, supra opacis, sparse (in nervis densius) pubescentibus, subtus cano- vel ferrugineo-glaucis, molliter pilosis, nervis prominulis; petiolo subito deflexo, limbo dimidio brevior, sordide tomentosus: inflorescentia ♂ axillari, e ramulo novello tenui et valde elongato, bracteis parvis cordato-orbicularibus et longe aristatis donato; paniculis 4, in axillulis fasciculatis; pedunculis capillaribus, longiusculis, bracteas 4–8-plo superantibus, apice trichotome corymbosis; sepalis fuscis, cuneato-oblongis, epunctatis, extus pilosis.—In ins. Mauritio: v. s. in herb. Lindl. ♂, Mauritius (ex hb. Lambert); in herb. Hook. ♂, Mauritius (Bouton).

This is a species differing from the preceding in its smaller, more ovate leaves, on shorter petioles, and in its very elongated racemiform ♂ inflorescence, with small leaf-like bracts, and in its epunctate sepals. From *Dissopetalum Mauritanum* it differs in its more cordate leaves with shorter petioles, in its ♂ inflorescence, and in its ♀ flowers. Its leaves are  $2\frac{3}{4}$ –3 inches long,  $2\frac{3}{8}$ – $2\frac{3}{4}$  inches broad, on a petiole  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long, inserted 1 line within the margin of the basal sinus, which is 4–6 lines deep. The ♂ inflorescence is 6–10 inches long, having in each of its axils, which are 6–9 lines apart, a small leaf-shaped bract 3 lines in diameter, and also three or four fasciculated panicles, on capillary peduncles 1 inch long, terminated by three primary branches 2 or 3 lines long, which are again severally divided; the sepals are oblong, acute, pilose externally, of a dusky colour, and epunctate; the petal is cyathiform and glabrous; the anther 4-lobed.

53. *Cissampelos mucronata*, A. Rich. Flor. Seneg. 11;—C. apiculata, Hochst. Bot. Zeit. xxviii. 95; Walp. Rep. v. 17;—C. Vogelii, nob. in Hook. Fl. Nigrit. 214;—C. comata, nob. l. c. 215;—C. cordifolia, Bojer, Ann. Sc. Nat. 2 sér. xx. 54; Walp. Rep. v. 17;—C. Pareira, Eichl. (non Linn.) in Mart. Fl. Bras. f. 38, p. 189;—radice tuberosa, majuscula; ramulis subtenuibus, teretibus, retrorsum pubescentibus, demum subglabris; foliis subpeltatis (junioribus fere palatis), deltoideo-ovatis, imo profunde cordatis, lobis basalibus rotundatis, ultra medium angustioribus, apice obtusis, emarginatis et mucronatis, e basi 5–7-nerviis, supra pallide viridibus, molliter sericeo puberulis, nervis canescen-

tibus, subtus griseo- vel ferrugineo-glaucis et densius pubescentibus; petiolo tenui, limbo dimidio brevior, pilis retrorsis tomentoso, imo refracto: paniculis ♂ 2-4, in axillis fasciculatis, petiolo brevioribus, pilosulis, trichotome divisis, et capitato-cymulosis, sæpe cum ramulo novello racemiformi interdum valde elongato comitatis, cujus axillis bractea orbiculari petiolulata pilosa paniculisque 3 donatis, vel bracteis interdum deficientibus; sepalis 4, rarius 5, cuneato-ovatis, extus pilosis, maculato-pictis; petalo cyathiformi, glabro; anthera 8-10-, rarius 6-loba: racemis ♀ axillaribus, solitariis, rarius binis, spicato-scorpioideis, petiolo duplo longioribus, tomentosis, bracteatis; bracteis parvis, orbicularibus, petiolulatis, complicatis, longe aristatis; floribus 5-9, in axillis fasciculatis, pedicellatis; sepalo lanceolato-ohlongo, extus piloso; petalo dimidio brevior, cuneato-reniformi, apice late retuso, carnosulo, glabro; ovario dorso piloso.—In Africa: *v. s. in herb. Mus. Brit., Hook. et Lindl.* ♂ & ♀, Fazokel, Abyssinia (Kotschy, 504); *in herb. Hook.*, Walo Senegambiæ (Heudelot), ♂ & ♀, Attah et Dagore, fluv. Quorra (Vogel), Shupanga, Zambesi (Dr. Kirk), riv. Luabo (Kirk); *in herb. Lindl.* ♂, Natal (Gueinsius, 165); *in herb. Mus. Brit. et Hook.* ♂, Natal (Krauss, 252), ♂ & ♀, Mauritius (Wallich).

This species has an extensive range; for I am not able to find any specific distinction between the more northern and the more southern specimens, except in the size of the leaves and the length of the inflorescence; in other respects the characters are alike. In the Abyssinian plants the leaves are more orbicular, in those from Natal they are more oval. The leaves are  $2\frac{1}{2}$ - $3\frac{1}{2}$  inches long,  $2\frac{1}{8}$ - $3\frac{1}{2}$  inches broad, with a basal sinus 4-7 lines deep, the petiole ( $1\frac{1}{4}$ - $1\frac{1}{2}$  inch long) being inserted  $\frac{1}{2}$ -1 line within the margin of the sinus. The axillary ♂ panicles are  $\frac{1}{2}$ -1 inch long, including the peduncle of 4-7 lines; the floriferous branch accompanying them is often 8 inches long, or sometimes much shorter; in the longer one the more inferior bracts (or young leaves) are  $\frac{1}{2}$  inch in diameter, diminishing upwards to a diameter of 3 lines; in the Natal specimens the panicles which grow out of these bracts are 4-8 lines long; in the Quorra plants they are 1 inch long, and more capillary. The ♀ racemes are  $1\frac{1}{4}$ - $3\frac{1}{2}$  inches long, with bracts 4 lines apart and 2-3 lines in diameter. Bojer's plants from Madagascar appear to differ from those of Wallich in the ♂ flowers having five sepals and a 10-lobed anther, thus according with other plants of this species.

54. *Cissampelos nephrophylla*, Bojer, Ann. Sc. Nat. 2 sér. xx. 54; —C. Pareira, *Eichl. (non Linn.) l. c.* p. 189;—in graminosis

repens; ramis tortuosis, glabris; ramulis tenuibus, teretibus, pubescentibus, demum glabris; foliis subpeltatis, reniformi-orbiculatis, in ♂ magis cordatis, apice retusis, in ♀ sinu latissimo minime cordatis, apice emarginatis, mucronatis, marginibus revolutis, utrinque subpuberulis, vel fere glabris, 5-7-nerviis, valde reticulatis, supra atroviridibus, subtus ferrugineo-glaucis et tomentosis, nervis rubescentibus; petiolo limbo æquilongo vel longiore, tenui, deflecto, pubescente; paniculis ♂ binis vel solitariis, axillaribus, pilosulis, petiolo brevioribus, subcorymbosis; sepalis 4-5, extus pilosis, lineato-pictis; vel interdum inflorescentia e ramulo novello axillari deflecto racemum elongatum folio 6-8-plo longiorem simulante, rachi gracillima, bracteata; bracteis remotiusculis, reniformi-orbiculatis, petiolulatis, singulis paniculis corymbosis geminis 3-plo longioribus munitis: racemo ♀ axillari, petiolo 2-plo longiore, spicatum bracteato; bracteis subimbricatis, foliiformibus, utrinque sordide glaucescentibus et glaberrimis; floribus in axillulis 3, fasciculatis; pedicellis ovarisque glabris; stylo brevi, crassiusculo; stigmatibus 3, erecto-divaricatis, subulatis.— In Senegal et ins. Madagascar: *v. s. in herb. Hook.* ♂, prov. Eminora, Madagascar (Bojer), Senegal (Römer); ♀, Madagascar (Lyll, 89).

The above diagnosis is made from the typical specimen collected by Bojer in Madagascar, where it was found creeping in grassy places, and known by the name of *Bouru-ravin*. I have regarded Lyall's specimen as the ♀ plant of the same. The species is distinguished by its slender twining stem, its small, reniform, almost glabrous leaves, and its short corymbose panicles, either in the axils of the main leaves or in those of axillary elongated raceme-like branchlets. The main branches are slender and twining, with axils about 1 inch apart; the leaves in the ♂ plant are 9 lines long, 13 lines broad, with a basal sinus 1-2 lines deep, upon a slender petiole 6-8 lines long, which is fixed 1 line within the basal margin; in the ♀ the leaves are 15 lines long, 18 lines broad, with a basal sinus  $\frac{1}{2}$  line deep, upon a petiole 14-17 lines long, inserted  $1\frac{1}{2}$  line within the margin of the sinus. The panicles are of the same length (6-9 lines), in the axils of the main branch as in those of the raceme-like branchlets, where the leaves are reduced to the size of bracts; the flowering racemes or branchlets are 6-8 inches long, with axils  $\frac{1}{2}$  inch apart, each being furnished with two panicular corymbs and a leaflet 3 lines in diameter. The ♀ raceme is  $1\frac{3}{4}$  inch long; its subimbricated and often plicated bracts, 3 lines in diameter, are similar to those of the ♂ inflorescence.

\*\*\* Folia palata aut obsolete peltata; frutices scandentes aut subproni, ramosi, ramis rarius erectis.

55. *Cissampelos tannifolia*, nob.;—ramulis teneris, flexuosis, striatis, patentim pilosis; foliis minime peltatis, parvis, deltoideis, sinu lato profundiusculo cordatis, angulis basalibus rotundatis, dehinc ad summum (lateribus rectis) acutangulatis, apice acutis et mucronatis, rigidulis, 5–7-nerviis, supra viridibus, nitentibus, utrinque glabris, valde reticulatis, subtus cinereo-glaucis, nervis tenuibus vix prominulis, marginibus cartilagineis, subciliatis; petiolo tenui, limbo triplo brevior, patentim piloso: paniculis ♂ axillaribus, 4, fasciculatis; folio dimidio brevioribus; pedunculo patentim piloso, petiolum æquante; ramis puberulis, subumbellatim corymbosis; floribus minutis; pedicellis capillaribus, glabris; sepalis cuneato-oblongis, medio guttatim obscuris, marginibus hyalinis, glaberrimis; petalo cyathiformi, 4-sulcato, glabro.—In Africa australi: *v. s. in herb. Lindley*, ♂, Delagoa Bay (Forbes, 11).

This species is distinct from all others that I have seen, on account of its rigid, cordate, small, glabrous leaves, with straight sides angularly converging into an acute apex; they are  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long,  $1\frac{3}{8}$ – $1\frac{1}{2}$  inch broad, with a basal sinus 2–3 lines deep, the petiole (4–5 lines long) being inserted  $\frac{1}{2}$  line within the margin of the sinus. The ♂ panicles are  $\frac{3}{4}$  inch long, with a peduncle 5 lines long, terminated by four or five short, umbellately spreading rays, which are again corymbosely divided; the flowers are very minute.

56. *Cissampelos torulosa*, E. Meyer;—*Menispermum capense*, *Linn.*, *Thunb. Fl. Cap. ed. Schultz.* 402; *Enum. Eckl. Zeyh.* 3; *Zeyh. Linnæa*, xix. 601;—ramulis teretibus, striatis, patentim pilosis, demum glabris; foliis palatis, late reniformibus, sat profunde cordiformi-bisinuatis, et juxta petiolum cuneato-angustatis, apice obtusis vel rotundatis, interdum emarginatis et mucronulatis, 5-nerviis, utrinque glabriusculis vel sparse pilosis, subtus pallidis aut thalassino-glaucis; petiolo tenuissimo, limbo æquilongo vel longiore, glabro aut summo patentim piloso: paniculis ♂ axillaribus, solitariis vel binis, glabris; pedunculo filiformi, petiolo 2–5-plo brevior, apice corymboso, paucifloro; floribus minutis, pedicellatis, glaberrimis; sepalis 4, ellipticis, subacutis, omnino glabris; anthera 4-loba: racemo ♀ axillari, solitario, folio petiolo 3–5-plo longiore, paucibracteato; bracteis foliiformibus, complicatis; floribus intra bracteas pedicellatis et fasciculatis.—In colonia Capense: *v. s. in herb. Hook. et aliorum*, ♂, Uitenhage

(Harvey, 679); Adow, Algoa Bay; Caffraria Brit. (Cooper, 120); Natal (Sanderson, 393); Norambello, lat. 14° 19' (Kirk); Kryсна (Bowie); D'Urban (MacKen, 644); ♀, Kattivier, Cafferland (Drège).

This plant, neglected by botanists, was evidently known to Linnæus, and forms a very distinct species; it is of climbing habit, approaching *C. nephrophylla*, but differing in its larger, broadly reniform leaves, cordately bisinuate at base, with a short cuneate expansion at the bottom of the sinus, into which the petiole is palately inserted. The leaves are  $1\frac{1}{4}$ – $1\frac{3}{4}$  inch long (including the very broad basal sinus 2–5 lines deep),  $1\frac{1}{2}$ – $2\frac{1}{2}$  inches broad, the petiole being 1–2 inches long. The corymbose axillary ♂ panicle is  $\frac{1}{2}$  inch, or more often 1 inch long, including its peduncle of  $\frac{3}{4}$  inch. The ♀ raceme is 5 inches long; the deeply cordate and reniform, leaf-like, glabrous bracts are 4–6 lines broad.

57. *Cissampelos capensis*, Thunb. Prodr. 100; Poir. Dict. v. 11; DC. Syst. i. 538, Prodr. i. 102;—*C. fruticosa*, Thunb. l. c.; Linn. fil. Suppl. 432;—*C. humilis*, Poir. l. c. 11; DC. Syst. i. 538, Prodr. i. 102;—caule procumbente; ramulis brevibus et erectis, vel longioribus, tenuibus et subscandentibus, subvelutinis vel glabris; foliis palatis, parvis, oblongis aut obovatis, imo truncato-obtusis, ultra medium angustioribus, apice rotundatis et mucronulatis, 3–5-nerviis, marginibus nervulo incrassatis, utrinque glaberrimis et glaucis, fusco reticulatis; petiolo tenui, limbo brevioris vel æquilongis: paniculis ♂ supraaxillaribus, geminis, e pulvino tomentoso ortis; pedunculis petiolo dimidio brevioribus, apice paucifloris; floribus subagglomeratis, minimis; sepalis extus albido pilosis; petalo cyathiformi, integro, glabro; anthera 4-loba.—In C. B. Sp. per totam coloniam: v. s. in herb. variis.

The characters which have been published under the names above enumerated are far too short to be of any value; and the specimens I have seen do not enable me to identify any one of them that can be considered specifically distinct from the type: I have therefore regarded all as belonging to one species. It is evidently a shrubby plant, of low and stunted growth, apparently common in rocky places throughout the Cape colony. The stem appears generally prostrate, sending out several short upright branches, from 8 to 12 inches high, furnished often at close intervals with very short ramifications; but above that height they often send out longer and weaker shoots that twist and climb for support upon the surrounding bushes; and it is probable that *C. humilis* and *C. fruticosa* have been founded



upon these variable conditions. The leaves vary much in form in the same specimen, are 6–15 lines long, 3–11 lines broad, the petiole being generally little more than half the length of the blade; and when equally long, it is more filiform. The peduncles, always growing out of a tuft of white hairs, are 2–4 lines long, surmounted by a small head of minute tomentose flowers. I have never seen a female flower, and have met with only a single seed, which adhered to the leaf of a solitary specimen.

### 3. ASIATICÆ.

\* Folia peltata; frutices scandentes.

58. *Cissampelos diversa*, nob.;—*C. Pareira*, *Hook. & Th.* (*non Linn.*) *MS.*;—ramulis teretibus, striatis, glabris; foliis profunde peltatis, deltoideo-oblongis, imo orbicularibus, mox gradatim angustatis, et valde acutis, 9–11-nerviis, nervis extus præcipue ramosis, supra viridibus, reticulatis, glaberrimis, subtus cinereo tomentosus, nervis prominulis; petiolo striato, fere glabro, limbo subæquilongo, supra basin tumidulo: racemo ♀ axillari, petiolo brevior; bracteis orbicularibus, imbricatis, 6-floris; floribus breviter pedicellatis et fasciculatis; sepalo obovato, extus piloso; petalo parvo, orbiculato, breviter unguiculato, extus piloso; ovario piloso.—In India orientali: *v. s. in herb. Hook.*, Khasya (*Hook. & Th. sub nom. cit.*).

This species does not bear any resemblance to *C. Pareira*, *Linn.*, to which it is referred by the authors of the 'Flora Indica.' It is different from any Indian or American species I have seen, its chief peculiarity consisting in its deeply peltate leaves, which much resemble those of *Stephania*; they are quite round in their lower moiety, whence the sides gradually converge in straight lines to a sharp acuminate point, being  $3\frac{3}{4}$  inches long,  $2\frac{3}{4}$  inches broad, on a petiole  $3\frac{1}{4}$  inches long, which is inserted 11–13 lines within the basal margin. The ♀ raceme is 1 inch long, with imbricating bracts 2 lines in diameter.

59. *Cissampelos elata*, nob.;—ramulis teretibus, retrorsum sericeo pubescentibus; foliis profunde peltatis, deltoideo-orbiculatis, latiusculis, imo subtruncatis, vel sinu levissimo retusis, a medio gradatim angustioribus, apice obtusis aut rotundioribus, emarginatis et aristato-nucronatis, marginibus revolutis, pilis flavidis sæpius dense fimbriatis, 9–11-nerviis, supra glabris vel sparse pilosis, subtus cano-vel fulvo-glauciscentibus, pilosis, et ad nervos prominulos divaricatim hirsutis;

petiolo crassiusculo, pube flavida sericea tomentoso, limbo dimidio brevior vel æquilongus: paniculis ♂ axillaribus, 2-3, fasciculatis, petiolo subæquilongis vel dimidio brevioribus, cum ramulo novello florifero racemiformi longiore enatis, hoc bracteis parvis, foliiformibus, petiolulatis, aristatis, omnium pedunculo dichotome ramoso; floribus capitato-corymbosis; sepalis obovatis, lineis interruptis pictis, extus pilosis; petalo cyathiformi, maculatim picto, glabro; anthera 4-lobo, lobis sæpe subdidymis: racemis ♀ axillaribus, solitariis aut binis, folio subæquilongis, imbricatim bracteatis; bracteis suborbiculatis, membranaceis, inferioribus subglabris, superioribus minoribus et sericeo pubescentibus; floribus pedicellatis 8, in axillis fasciculatis; sepalo lineari-oblongo, valde concavo, extus piloso; petalo minimo, orbiculari, carnosulo, glabro, sepalo 5-plo brevior, mox deciduo; ovario piloso; stylo longo, crassiusculo, stigmatibus acutis, divaricatis; drupis minusculis, pilosis, putamine suborbiculari, paulo compresso, utrinque in seriebus tribus tuberculato.—In Himalaya, Ava, et insulis Moluccanis: *v. s. in herb. DeCandolle*, ♂, Nepal (Wallich, 1826); *in herb. Soc. Linn.* (Wall. Cat. 4977 ♂); *in herb. Hook.* ♂, Nepal (Wallich in 1821); ♀, Simla, Himalaya (Lady Dalhousie); Buschir, Sutlej (Jacquemont, 1093); ♀, Soane River (Burelli); ♂, Gurwhal (Falconer, 90); *in herb. Mus. Brit.*, ins. Honimon (Smith).

This is a distinct species, differing from the preceding in its more orbicular, less peltate, more pilose leaves, which are truncated at the base and not acuminate at the summit, with the margins thickly fringed, and having a hairy petiole; from the following it also differs in its more hirsute, broader, more orbicular, and more peltate leaves, on a shorter and more pubescent petiole. The leaves, in the specimens from the Himalaya regions, are  $2\frac{1}{2}$ - $3\frac{1}{8}$  inches long,  $2\frac{1}{2}$ - $3\frac{1}{8}$  inches broad, on a petiole  $1\frac{1}{2}$ - $2\frac{1}{2}$  inches long, inserted 6-8 lines within the truncated basal margin, the mucronated point being 2 lines long. The ♂ panicles are  $1\frac{3}{4}$  inch long, the peduncle measuring 1 inch, its alternate branches being 2 lines apart and 2 lines long, each bearing a corymbose head of flowers: the floriferous raceme which accompanies the panicles in each axil is  $1-2\frac{1}{2}$  inches long, and has a few bracteiform leaflets at its base, the basal leaflet being 3 lines in diameter, the others diminishing to half that size, the fasciculated panicles accompanying them being half the length of those of the main axils, and all are sericeously pubescent. The ♀ racemes are 3-4 inches long, with closely imbricated bracts 3-5 lines in diameter; the putamen is  $1\frac{3}{4}$  line in diameter, and  $1\frac{1}{4}$  line thick.

I have placed here provisionally the plant from Honimon, which is probably a distinct species, differing in its more hirsute, larger, more deeply peltate leaves upon longer petioles, and in its dichotomous ♂ panicles, the flowers having a campanulate petal, pilose outside, half the length of the spatulate, broadly oblong sepals: its subdeltoid leaves are 4 inches long, 4–4 $\frac{1}{4}$  inches broad, with a shallow wide basal sinus 2 lines deep, on a somewhat retrorsely pubescent slender petiole, 3 $\frac{1}{4}$  inches long, inserted 6–8 lines within the margin of the basal sinus: the axillary panicles have a peduncle 8 lines long, with dichotomous branches 3 lines long, and a short pedicel in each sinus of the ramifications; the floriferous axillary raceme which accompanies them is 2 $\frac{1}{2}$  inches long, with leaf-like bracts 3 lines in diameter, and panicles at the origin of each bract  $\frac{3}{4}$  inch long.

60. *Cissampelos grillatoria*, nob. ;—ramulis teretibus, contortim striato-sulcatis, glabris vel parce pubescentibus; foliis peltatis, deltoideo-orbicularibus, imo rotundiusculis, latissime ac breviter cordatis vel truncatis, deinde subito constrictis, apice obtusis, emarginatis et cuspidato-mucronatis, 9–11-nerviis, supra glabris, reticulatis, subtus cano- vel fulvo-glaucis, adpresse puberulis, nervis venisque reticulatis, stramineis et prominentibus; petiolo valde elongato, subtenui, striato, imo tortuoso, limbo sæpius 2-plo longiore, subglabro, apicem versus pilis retrorsis canis tomentoso: paniculis ♂ axillaribus, 3, fasciculatis, valde pubescentibus, petiolo 3–6-plo brevioribus, bi-trichotome ramosis; floribus corymbosis aut ramulo novello cum paniculis sæpe enato, iis paulo longiore, racemiformi, axillis foliolum parvum bracteiforme sæpe abortivum paniculasque 3 breves emittentibus; sepalis cuneato-oblongis, extus vix pilosis, maculis seriatim pictis; petalo cyathiformi, integro; anthera 4-loba: racemis ♀ axillaribus, geminis, petiolo subbrevioribus; rachi pilosa, bracteis imbricatis, suborbicularibus, membranaceis, valde reticulatis, fere glabris, axillis 7-floris; sepalo obovato, maculatim picto, petalogo minimo orbiculari extus piloso; drupis parvis, pilosis.—In India orientali: *v. s. in herb. Soc. Linn.* ♂ et ♀, Goyalpoor (Wall. Cat. 4977 B, a, 4977 A, b); ♂ et ♀, Segain, Prome (Wall. Cat. 4977 G); *in herb. De Cand.* ♂ et ♀, Prome (Wall. 1291, non Cat.); *in herb. Lemann*, ♂ et ♀, Bhootan (Griffiths, 1730); *in herb. Hook.* ♂ et ♀, Khasya, Punjab, et Sikkim (Hook. & Th.); ♂, Assam, et ♀, Bengal (Griffiths); Ceylon (Walker, 329); *in herb. Heward*, ♂, Coltura, Ceylon.

This species is distinguished from all the peltate species by its deltoid-orbicular leaves, which are more or less obtuse at their summit, and are borne upon very long and slender petioles.

It offers the same relation to *C. convolvulacea* that the American species *C. longipes* bears to *C. Pareira*. In the ♂ specimens with larger leaves, the latter are more orbicular,  $3\frac{3}{4}$ –4 inches long,  $4$ – $4\frac{1}{4}$  inches broad, on a petiole  $3$ – $3\frac{1}{4}$  inches long, inserted 4 lines within the margin of the shallow, broad basal sinus. In most of the Wallichian specimens the leaves are more deltoid,  $2\frac{1}{2}$ – $2\frac{3}{4}$  inches long,  $2\frac{1}{2}$ – $2\frac{3}{4}$  inches broad, on petioles  $2\frac{3}{4}$ –4 inches long, which are inserted 4 lines within the basal margin. In the Ceylon plants they are  $1\frac{3}{4}$ – $2\frac{3}{4}$  inches long and broad, on a very slender petiole  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches long, inserted 2 lines within the margin. The ♂ panicles are seldom more than  $\frac{3}{4}$  inch long: the ♀ racemes 1–3 inches long, with imbricating bracts 2–4 lines in diameter.

61. *Cissampelos Cumingiana*, nob.;—ramulis tenuibus, teretibus, contortim striatis, retrorsum pubescentibus vel glabriusculis; foliis peltatis, deltoideis vel deltoideo-orbicularibus, angulis basalibus rotundis, imo sinu lato sat profunde cordatis, a medio lateribus incurvantibus sensim angustatis, apiculo acuto vel rarius obtusulo et emarginulato, 9–11-nerviis, supra subnitidis, glabriusculis, reticulatis, nervis venisque rufulis, subtus cano-vel fulvo-glauciscentibus, sparse puberulis; petiolo tenuissimo, striato, retrorsum albido tomentosus, limbo dimidio brevior: paniculis ♂ axillaribus, solitariis vel geminis, petiolo brevioribus, corymbosis; pedunculo gracili piloso, ramis capillaribus 3, ramulis 2 spicatum plurifloris, pilosis, sæpe cum ramulo novello florifero racemiformi enatis, hoc bracteis foliiformibus donato, paniculis in axillis 2–3 brevioribus; floribus parvis; sepalis 4, obovatis, seriatim maculato-pictis: racemo ♀ axillari, petioli vix longitudine, imbricatim bracteato; bracteis infimis foliiformibus parvis, superioribus minimis; axillis 3–4-floris; drupis parvis, pilosis.—In archipel. Indico: *v. s. in herb. variis*, ins. Philipp. ♂ et ♀ (Cuming, 691); ♂. ins. Malay. (Cuming, 1613).

This is a more slender plant than most of the preceding species, with smaller, more triangular, pointed, heart-shaped leaves of thinner texture, and with a more slender and shorter petiole. The leaves are  $3\frac{1}{2}$  inches long (including the basal sinus  $\frac{1}{2}$  inch deep),  $3\frac{3}{8}$  inches broad, the petiole ( $1\frac{1}{2}$  inch long), suddenly recurved at base, being inserted 4 lines within the margin of the sinus: some younger leaves are  $2\frac{1}{4}$  inches long, 2 inches broad, with a basal sinus 4 lines deep and a petiole  $1\frac{1}{4}$  inch long, which is inserted  $2\frac{1}{2}$  lines within the margin. The ♂ panicles, shorter than the petioles, have a very slender peduncle 6 or 7 lines long, its branches being 2 lines. The ♀ raceme is 1 inch long, with leaf-shaped bracts 3 lines in diameter, the axils bearing four or

five flowers; the sepal is small and orbicular; the petal, also round, is very little smaller, both spotted and pilose outside: the drupe is 2 lines in diameter and pilose; the putamen, compressed, has nine ridges radiating from the condyle.

62. *Cissampelos hirsuta*, Buchanan; DC. Syst. i. 535, Prodr. i. 101;—*Cissampelos* Pareira, Hook. & Th. (non Linn.) *Fl. Ind.* i. 198; *Eichl. l. c.* p. 189;—ramulis flavo-virentibus, dense cinereo pilosis; foliis peltatis, subovatis, imo rotundatis vel subtruncatis, apice obtusis vel subacutis, sæpe longe mucronatis, marginibus sericeo fimbriatis, 7-9-nerviis, supra subpubescentibus, fuscis, rugosulis, opacis, nervis tenuibus, flavidis, prominulis, subtus pilis flavidis, dense sericeo tomentosis: paniculis ♂ axillaribus, solitariis, petiolo paulo longioribus, dense patentim pilosis; pedunculo tenui, dichotome diviso; floribus corymbosis, subcapitellatis; sepalis cuneato-ovalibus, maculatim pictis, petaloque cyathiformi extus pilosis: racemis ♀ axillaribus, binis, petiolo 2-plo longioribus, tomentosis, imbricatim bracteatis; bracteis orbicularibus, aristatis, supra fusculis, puberulis, marginibus flavide fimbriatis, subtus tomentosis; floribus in axillulis 8, fasciculatis, sepalo cuneato-oblongo, petaloque cuneato-reniformi 4-plo brevioribus, extus hirsutis; ovario hirsuto.—In India orientali: *v. s. in herb. Mus. Brit.* ♂, Sembu, Nepal (Buchanan); *in herb. Mus. Brit. et Lindl.* ♀, Nielgherries (Hook. & Th.); *in herb. meo*, ♀, Coimbatore (Gardner); *in herb. Hook.*, Almora, Kumaon (Strachy & Winterbottom).

A very distinct species, easily recognized by its small, broadly ovate, peltate, very velvety leaves, in ♂ much rounded at base and obtuse at summit, with a short, thick petiole; in ♀ more deltoid, truncated, with a very shallow sinus at base, more acute at summit, with a somewhat longer petiole. The leaves are  $1\frac{1}{2}$ – $2\frac{1}{2}$  inches long,  $1\frac{3}{8}$ – $2\frac{1}{4}$  inches broad, on a petiole 9 lines long in ♂, 9–12 lines long in ♀, inserted in ♂  $2\frac{1}{2}$ –3 lines, in ♀ 2 lines within the basal margin. The ♂ panicle is 1– $1\frac{1}{2}$  inch long, including its slender peduncle  $\frac{3}{4}$  inch long; the sepals are oval, with long villous hairs outside: the ♀ raceme is  $1\frac{1}{4}$ –2 inches long, clothed from its base with closely imbricated, pilose, orbicular bracts 2 lines in diameter.

63. *Cissampelos discolor*, DC. Syst. i. 534, Prodr. i. 101;—*Cissampelos* cardiophylla, A. Gray, *Bot. Wilkes's Exped.* p. 38;—*Cissampelos* Pareira, Blanco (non Linn.), *Fl. Filip.* p. 815; *Walp. Reliq. Meyen.* 209; *Hook. & Th. (non Linn.) l. c.* 198; *Eichl. l. c.* p. 189;—ramulis tenuibus, striatis, subglabris; foliis peltatis, deltoideis, angulis basalibus

valde rotundis, imo sinu lato subcordatis, ultra medium lateribus subito sinuato-incurvis, longiuscule acuminatis, acumine obtusulo et mucronato, submembranaceis, 5-7-nerviis, supra fusco-viridibus, opacis, pilis sparsis vix pubescentibus, reticulatis, subtus cinereo opacis et puberulis, nervis teneribus, subprominulis, venisque nigris; petiolo tenui, striato, imo crassiore et torto, patentim piloso, limbo fere æquilongo: paniculis ♂ axillaribus, geminis vel ternis, fasciculatis, corymbosis, petiolo subæquilongis, bis 2-3-chotome ramosis, floribus in ramulis ultimis spicatum pedicellatis; vel paniculis interdum in ramulo novello aphylo enatis, 3 in axillis, fasciculatis, his sæpius minime bracteolatis vel rarius bractea parva foliiformi pubescente donatis, hinc racemum folio æquilongum mentientibus; sepalis ovatis, unguiculatis, extus pilosis.—In India orientali et in insulis: *v. s. in herb. Mus. Brit. et aliorum*, ins. Philipp. (Cuming, 1440), Moulmein (Wallich, 1291 in parte, non Cat.).

The above plants seem to agree with Dr. A. Gray's description of his *C. cardiophylla* and with De Candolle's short diagnosis of his *C. discolor*; but the latter must not be confounded with *C. discolor* of Wallich and *Clypea discolor* of Blume.

It differs from *C. Cumingiana*, from which it is easily distinguished by its narrowly acuminate leaves with longer petioles. The leaves are  $2\frac{1}{2}$ - $2\frac{3}{4}$  inches long,  $2$ - $2\frac{1}{4}$  inches broad, on a petiole  $1\frac{1}{2}$ - $1\frac{3}{4}$  inch long, inserted  $1\frac{1}{2}$  line within the margin of the broad and shallow basal sinus: the ♂ panicle is  $1$ - $1\frac{1}{2}$  inch long, the peduncle being 8-12 lines, the primary rays 3 lines, each dichotomously divided, with a short pedicel in each sinus, the short ultimate rays spicated with crowded pedicellated flowers; the sepals are cuneately oblong, marked with dark glandular lines, and are, as well as the shallow cup-shaped petal, pilose outside.

64. *Cissampelos eriantha*; nob.;—ramulis teretibus, striato-sulcatis, retrorsum puberulis aut glabrescentibus; foliis subpeltatis, oblongis, imo sat profunde cordatis, sursum gradatim angustioribus, apice obtusis, emarginatis et mucronatis, 7-9-nerviis, supra fere glabris aut puberulis, subtus pallidioribus, ochreo-glaucis et pubescentibus; petiolo tenui, striato, flavo pubescente, imo torto, limbo æquilongo aut paulo brevior: paniculis ♂ axillaribus, petiolo 3-plo brevioribus, trichotome divis; floribus corymbosis; petalis spathulato-ovatis, parallelim interrupte maculatis, extus pilosis; petalo cyathiformi, integro, radiatim picto, extus pilosulo; anthera 4-loba: racemo ♀ axillari, petiolum æquante, tomentoso, imo foliifero, mox subimbricatim bracteato; bracteis orbicularibus, membrana-

ceis, supra subglabris; floribus in axillis, 7-8, fasciculatis, pedicellatis; sepalo cuneato-oblongo, margine crenato, extus pilosulo; petalo reniformi, dimidio brevior; ovario piloso; drupis parvis, pilosulis.—In India orientali: *v. s. in herb. Lindley*, ♀, Peninsula (Wight, 39); *in herb. Soc. Linn.* ♂, Kumaon (Wall. Cat. 4979 a, 4977 c); *in herb. Hook.* ♂, Jainia Himalaya (Hook. & Th.); *in herb. Mus. Brit.*, Punjab (Hook. & Th.).

Specimens of this plant were distributed from Dr. Wight's collection under the name of *C. convolvulacea*; but it differs from that species in the very elongated form of its much larger leaves, which are of a fuscous hue and nearly glabrous above; they are  $3\frac{1}{4}$ -4 inches long,  $2\frac{1}{2}$ -3 inches broad, on a petiole  $3-3\frac{1}{2}$  inches long, which is inserted 1 or 2 lines within the margin of the basal sinus. The ♀ raceme is 2-3 inches long; the basal floral leaf is  $\frac{3}{4}$  inch long, the bracts  $2-2\frac{1}{2}$  lines in diameter.

65. *Cissampelos obtecta*, Wall.;—*C. Pareira*, Hook. & Th. (*non Linn.*), *l. c.* 198; *Eichl. l. c.* p. 189;—ramulis pube patente sericea pilosis; foliis peltatis, orbicularibus vel reniformi-orbiculatis, summum versus haud angustioribus, apice emarginatis et mucronatis, imo sinu lato levissime cordatis, 9-11-nerviis, reticulatis, supra opacis, fuscis, sparse pilosis, subtus pallidioribus, sordide vel fulvido-glaucis, molliter subpilosis, ad nervum marginalem remote subcrenatis et lanato-ciliatis; petiolo crassiusculo, limbo 4-plo brevior, dense pubescente; paniculis ♂ axillaribus, corymbosis, petiolo vix longioribus; pedunculo filiformi furcatim diviso; ramis tenuissimis, puberulis, cum pedicello simplici in dichotomiis; sepalis 4-5, oblongis, subacutis, medio maculatim pictis, marginibus pellucidis, extus longe pilosis; petalo cyathiformi, integro, extus piloso; anthera 4-5-, rarius 6-loba: racemo ♀ axillari, folio brevior; rachi geniculatim flexuosa, nimie imbricatim bracteata; bracteis suborbicularibus, fere sessilibus, supra puberulis, subtus pilosis, marginibus ciliato-pilosis; floribus in axillis, fasciculatis, pedicellatis; sepalo subreflexo, rhomboideo-ovato, extus hispidulo; petalo reniformi, dimidio brevior, piloso; ovario hispidulo; stylo brevi.—In India orientali: *v. s. in herb. Mus. Brit.* ♂, Nepalia (Wall. A.D. 1819); *in herb. Soc. Linn.* ♂, Nepalia (Wall. Cat. 4981 A, non B, c), ♀ (Wall. Cat. 4979 a b), ♀, Ladak (Moorcroft in hb. Wall. Cat. 4979 d).

A species well distinguished by the peculiar appearance of its orbicular leaves with fimbriated margins and short stout petioles, differing from those of the preceding species and *C. hirsuta* in

their more orbicular form, and from those of *C. orbiculata* in being more peltate, more hairy, and with shorter petioles. The leaves are  $1\frac{1}{2}$ – $3\frac{1}{4}$  inches long,  $1\frac{1}{2}$ – $3\frac{3}{4}$  inches broad, on a petiole  $\frac{1}{2}$ – $1\frac{1}{4}$  inch long, inserted 2–4 lines within the basal margin.

\*\* Folia subpeltata; suffrutices scandentes.

66. *Cissampelos convolvulacea*, Willd. Sp. Pl. iv. 863; DC. Syst. i. 536, Prodr. i. 101; W. & Arn. Prodr. Fl. Pen. i. 14; Roxb. Fl. Ind. iii. 842;—*C. tetrandra*, Roxb. l. c. 842;—*C. Mauritiana*, Wall. (non Thouars); ejusdem, Wight in hb.;—*C. Pareira*, H. & Th. (in parte, non Linn.) Fl. Ind. i. 198; Eichler, l. c. p. 189;—*C. Pareiroides*, DC. Ess. Prop. Méd. 2 edit. i. 78;—*C. septemnervis*, Wall. in Cat.;—ramulis teretibus, sulcato-striatis, subtomentosis; foliis subpeltatis, reniformibus vel deltoideo-orbiculatis, imo sinu lato leviter cordatis, aut sinu angustiore profundius cordatis, vel margine petiolium versus retrocurvato hinc bisinuato-cordatis, apice rotundatis, emarginatis et mucronatis, marginibus sæpissime crassiusculis aut integris vel sinuato-crenatis, 7–9-nerviis nervoque marginali tomentoso, supra subglabris, subtus pallide vel flavescente pubescentibus; petiolo limbo æquilongus vel longiore, ad insertionem geniculato, pubescente aut tomentoso: paniculis ♂ axillaribus, 2–3, fasciculatis, petiolo brevioribus, trichotome ramosis, ramulis ultimis spicatum longe pedicellatis: racemis ♀ axillaribus, solitariis aut geminis, petiolo subæquilongis, e basi spicatum bracteatis; bracteis valde imbricatis, orbicularibus aut reniformibus, membranaceis, cano-glaucis et reticulato-venosis, supra glabris, subtus pubescentibus; floribus in axillulis, 4–7, fasciculatis; sepalo cuneato-oblongo; petalo reniformi-orbiculari, multo brevioris; ambobus extus hirsutis; ovario piloso.—In Indiæ peninsula: v. s. in herb. Soc. Linn. ♂ (Wall. Cat. 4979 B a, 4979 D b), ♀ (id. Calc. cult. 4979), Dendygal (id. 4979 A b, 4979 B b), Ragmohl (id. 4979 H), Mungger (id. 4979 J); in herb. Mus. Brit. ♀, Calc. cult. (Wallich), Ind. orient. (König), Fort Victoria (Hove), Ind. or. (Wight, 39); in herb. Hook. ♀, Madras (Hunter), et multa alia.

This species is widely diffused over the Indian peninsula, and is easily recognized by its broad reniform leaves and its general aspect. The leaves are generally broader than long, flatly rounded, rarely obtusely narrower at the summit, with rounded angles and a broad deep hollow at the base, the margin often recurved towards the petiole, so as to render the sinus bisinuate, and the contour is frequently indented by distant crenatures: they are usually  $1\frac{3}{4}$ – $2\frac{1}{2}$  inches long,  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches broad, on a petiole  $1\frac{1}{2}$ – $2\frac{1}{4}$  inches long, inserted 1 line within the margin of



the basal sinus, which is 3–5 lines deep. The ♂ panicles are 1 inch long, their peduncle being half their length, with widely spreading and twice dichotomously divided branches, and a sterile pedicel in each furcation, the ultimate rays being short and corymbose; the sepals are cuneately orbicular or oblong, clothed externally with long white hairs; the petal is depressed, cyathiform and glabrous. The ♀ racemes, 1½–4 inches long, are furnished with numerous closely imbricating bracts, 3–6 lines in diameter, on very short petiolules, each concealing from six to nine small pedicellated flowers; the sepal is cuneate-oblong, pilose outside; the petal, one-third of its length, is reniform or orbicular, and shortly unguiculated, somewhat fleshy, and nearly glabrous; the ovary is very pilose; the drupes are oval, compressed, and pilose.

67. *Cissampelos subpellata*, Thwaites, MS.;—ramulis teretibus, sulcato-striatis, nitidulis, glabris vel pubescentibus; foliis palatis aut obsolete peltatis, deltoideis aut deltoideo-ovatis, imo sinu lato leviter cordatis aut bisinuatis, sæpius a medio sensim acutis, apiculo hebeti, vel rotundioribus, apice emarginatis et mucronulatis, 7–9-nerviis, supra pallide viridibus, nitidulis, glabriusculis, in nervis subpuberulis, subtus cinereo-vel fulvo-glaucis, opacis, pubescentibus, nervis nitidis, rufulis aut nigrescentibus, marginibus interdum tomentosis; petiolo tenui, limbo subæquilongo vel longiore, sulcato, subglabro, apice pubescente: paniculis ♂ axillaribus, solitariis aut 2–4, fasciculatis, petiolum subæquantibus vel brevioribus, trichotome vel pinnatim ramosis; ramis remotis et valde divaricatis, sæpe bracteatis, bis furcatis, cum pedicello in dichotomiis, ramulis brevibus, spicatum plurifloris aut corymbosis, vel inflorescentia interdum e ramulo novello aphylo racemum elongatum simulante, axillulis breviter paniculatis: racemis ♀ axillaribus, solitariis aut binis, petiolo dimidio brevioribus; floribus 3, pedicellatis, in axillis, ebracteatis, fasciculatis; pedicellis longiusculis.—In Zeylania et peninsula Indica: *v. s. in herb. Soc. Linn.* ♂, Mungger (Wall. Cat. 4979 *s a*, non *b*); *in herb. Mus. Brit.* ♂, Ind. or. (Soc. Frat.); ♀, Kandy (König, 146); *in herb. Mus. Brit. et Hook.* ♂ et ♀, Ceylon (Thwaites, 168); *ib.* ♂ et ♀ (Thwaites, 169); *in herb. Hook.* ♂, Ceylon (Gardn. 34), ♀ *ib.* (Walker); *in herb. Lindl.*, Kandy (Macrae, 113); *in herb. DC.* ♂, Cotallam (Leschenault); *in herb. Soc. Linn.* ♂, Mungger (Wall. Cat. 4979 *s*).

This species is intermediate between *C. convolvulacea* and *C. orbiculata*, differing from the latter in its deltoid and larger leaves, on longer petioles, and from the former for the same reasons and because the leaves are not peltate; it is also di-

stinguished from them by its peculiar mode of inflorescence. The branches are slender, with remote axils; the leaves from the different localities differ much in size, varying from 1 to 3 inches long, 1-2 $\frac{3}{4}$  inches broad, on a petiole  $\frac{3}{4}$ -3 inches long, inserted  $\frac{1}{2}$ -1 line within the margin: in Mr. Thwaites's specimens they are almost palately inserted. The sepals in the ♂ flowers are spatulately ovate, very pilose outside; the corolla is cup-shaped, pilose outside, marked with interrupted red lines; the anther is 4-lobed.

\*\*\* Folia palata aut vix peltata; suffrutices scandentes.

68. *Cissampelos orbiculata*, DC. Syst. i. 537, Prodr. i. 101;—C. Pareira, Hook. & Th. (non Linn.) Fl. Ind. i. 198; Eichl. l. c. p. 189;—C. Caapeba, Roxb. (non Willd.), Fl. Ind. 842;—C. convolvulacea, Wall. in parte (non Willd.);—Cocculus orbiculatus, DC. Syst. i. 523, Prodr. i. 98;—Batta Valle, Rheed. Hort. Mal. xi. 127, tab. 62;—ramulis teretibus, subglabris, junioribus villosis; foliis palatis aut obsolete peltatis, suborbicularibus, imo cordatis, a medio paulo angustioribus, apice obtusis, emarginatis et mucronatis, interdum rotundioribus, 5-7-nerviis, supra pubescentibus, subtus cinereo- vel fulvo-glaucis, plus minusve villosis pubescentibus, marginibus tomentosis; petiolo pubescente, tenui, limbo subæquilongus: paniculis ♂ axillaribus, 2-3, fasciculatis, petiolo brevioribus, trichotome ramosis; floribus minimis, congeste corymbosis; interdum e ramulo novello florifero, racemum folio 3-plo longiorem mentientibus, rachi filiformi, axillulis inferioribus et remotiusculis, bractea foliiformi, superioribus bracteola parva donatis, singulis paniculis 3 brevissimis emittentibus: racemo ♀ axillari, folio longiore, imo folioloso, sursum bracteato et florifero, bracteis reniformi-orbiculatis, villosis, singulis floribus 7-8 fasciculatis donatis; sepalo spatulato-oblongo petaloque orbiculari vel reniformi, 4-plo brevioris, radiatim 2-3-nervi, ambobus extus dense pilosis; ovario villosis; stylo glabro, longiusculo; stigmatibus divaricatis.— In India orientali: v. s. in herb. Soc. Linn. ♂ et ♀, Sylhet (Wall. Cat. 4979), Dendyal jungles (Wall. Cat. 4979 A a, 4979 B); ♂, Madras (Wall. Cat. 4979 F); ♀, Nepal (Wall. Cat. 4979 G b 1, et 4981 A b), Sylhet (Wall. Cat. 4981 B), Oude (Wall. Cat. 4981 C); in herb. Lindl., Moulmein; in herb. Hook., Madras (Huuter); Punjab (Hook. & Th.); ♀, Assam (Griffiths, 569); ♂, Rangoon (McClelland).

This species may be distinguished from *C. convolvulacea* by its usually smaller, orbiculate, and palately leaves; and from *C. subpeltata*, to which it more closely approximates, by its more orbi-

cular leaves: it appears widely diffused over the peninsula. Its leaves are generally small; they are larger in the specimen from Sylhet, as in Rheede's figure; they are  $1\frac{1}{4}$ – $2\frac{1}{2}$  inches long,  $1\frac{1}{4}$ – $2\frac{1}{2}$  inches broad, on a petiole  $1$ – $1\frac{1}{2}$  inch long, inserted scarcely within the margin of the basal sinus, which is either obsolete or  $1$ – $2$  lines deep. The ♂ panicles are  $\frac{1}{2}$ – $1$  inch long; the racemose inflorescence  $1\frac{1}{2}$  inch long, with orbicular bracts 3 lines in diameter: the ♀ racemes are  $1\frac{1}{2}$ – $4$  inches long, the bracts 3–6 lines in diameter.

69. *Cissampelos delicatula*, nob.;—ramulis tenerrimis, striatis, subglabris; foliis vix peltatis, deltoideo-orbicularibus, imo subtruncatis aut minime cordatis, a medio sensim angustioribus, apice obtusiusculis aut emarginatis, mucronatis, membranaceis, 5–7-nerviis, supra subnitidis, subtus pallidioribus, sub lente parce puberulis vel glabriusculis; petiolo tenuissimo, limbo duplo longiore, striolato, subpubescente, in ♀ paulo brevior: paniculis ♂ axillaribus binis vel plurimis, petiolo dimidio brevioribus; pedunculo iterum dichotome ramoso, ramulis ultimis spicatum pedicellatis; floribus vel paniculis e ramulo novello fere aphylo ortis, pedunculo ramisque capillaribus subglabris, floribus minutis: racemo ♀ axillari, petiolo subæquilongo; bracteis orbicularibus, subparvis, imbricatis; flores circiter 6 celantibus.—In Malabar: *v. s. in herb. Hook.* ♂ et ♀, Kurg (Madras Coll. 60); ♂ Ind. or. (sub nom. *Clypea Wightii*, No. 37); *in herb. Heward*, Ceylon; *in herb. Soc. Linn.*, Hatowdah, Nepal (Wall. Cat. 4981 a b).

This is an extremely delicate and slender climber, differing from *C. orbiculata* in its much smaller, membranaceous, almost glabrous leaves, truncate at base, on a very elongated filiform petiole. The leaves are  $1\frac{1}{4}$ – $1\frac{3}{8}$  inch long,  $1\frac{3}{8}$ – $1\frac{1}{2}$  inch broad, on a petiole  $1\frac{3}{4}$ – $2$  inches long, inserted  $\frac{1}{4}$  line within the basal margin, and therefore almost palatè. The ♂ inflorescence consists of from two to six panicles fasciculated in each axil,  $\frac{3}{4}$ – $1$  inch long; they are twice dichotomously divaricated, with a pedicel in each furcation, the ultimate branches being charged with numerous pinnately arranged pedicels, all slightly pubescent: the sepals are suborbicular, pilose outside; the petal is extremely shallow and glabrous; the anthers 4-lobed, supported on a slender far-exserted filament. The raceme-like and very slender axillary floriferous branch, on an almost filiform flexuous rachis, is quite leafless, with axils 6–8 lines apart, each with two small panicles 4 lines long; rarely there is a small single leaflet near the base of the rachis, which is orbicular, 2 lines in diameter, on a petiolule 2 lines long.

## 26. ANTIZOMA.

Under this name I separated from *Cissampelos*, in 1851 (Ann. Nat. Hist. 2 ser. vii. 41), a small group of South-African plants possessing a very peculiar habit: two of them had been described by De Candolle,—one as *Cissampelos calcarifera* of Burchell, of which the male flower only was known; the other being the *Cissampelos angustifolia* of the same botanist, from a specimen of which I derived a knowledge of the female flower: to these, three other new species were then added. They are all small, erect shrubs, with somewhat the habit of *Lycium*, having almost simple stems or subsucculent branches. The leaves, unlike those of other *Menispermaceæ*, are linear, with extremely abbreviated petioles; they are opaque, thick, revolute on their margins, both surfaces being shagreened with extremely minute and crowded granulations. At each node, below the point of insertion of the petiole, there is a short, rigid and somewhat reflected spine—a feature peculiar to this genus, and quite singular in this family. The male inflorescence consists of one or two very short peduncles springing out of each axil, which bear on their summit from three to six minute flowers on short closely approximated pedicels; these male flowers differ in no respect from those of *Cissampelos*. The inflorescence and the structure of the female flower are, however, very different: this I found in a unique specimen in Dr. Burchell's herbarium, where on each axil one or two very short pedicels bear separately a single minute flower, with two oval concave sepals, placed oppositely, with their margins somewhat imbricated in æstivation; at the base within, and opposite to each sepal, is a very minute scale-like fleshy petal, placed at the base of a central ovary, which is nearly the length of the sepals, without any style, and with an obsolete stigma. This structure will be seen to offer much analogy to that of the genus *Peraphora*, and places them in a position intermediate between *Cissampelos* and *Homocnemia*, differing from the former in having double the number of floral parts, and from the latter in having half as many. Messrs. Bentham and Hooker were evidently unacquainted with the facts here shown when, in their 'Genera Plantarum' (p. 38), they amalgamated this genus with *Cissampelos*. The structure of the female flower, with a different kind of inflorescence, and the peculiar habit of all its species, certainly claim for *Antizoma* the rank of a distinct genus.

ANTIZOMA, nob. — *Flores* dioici. *Masc. Sepala* 4, cuneato-  
obovata, petalo 3-plo longiora. *Petalum* unicum, cyathiforme,  
depressum, margine crenulatum, carnosulum. *Stamen* unicum; *filamentum* centrale, breve; *anthera* peltata, horizontalis

4-10-loba, lobis rima extus dehiscentibus.—*Fœm. Sepala* 2, opposita, ovata, valde concava, carnosula, æstivatione paulo imbricata. *Petala* 2, sepalis opposita, minuta, squamiformia, orbiculata, carnosula, hypogyna. *Ovarium* unicum, obovatum, subcompressum, sursum conicum. *Stylus* nullus. *Stigma* fere obsoletum, aut vix obtuse bilobum. *Fructus* ignotus.

Frutices *Africae australis*, humiles, erecti vel subscaudentes; caulis ramulique sæpius virgati, spina infra petiolum muniti; folia alterna, plerumque parvula, linearia vel oblongo-lanceolata, integerrima, coriacea, breviter petiolata: racemi ♂ axillares, brevissimi; pedunculus flores paucos minutos pedicellatos approximatos gerens; pedicelli ♀ axillares, gemini, 1-flori.

1. *Antizoma calcarifera*, nob. Ann. Nat. Hist. ser. 2. vii. 41;—*Cissampelos calcarifera*, Burch. Trav. i. 389; DC. Prodr. i. 102;—humilis, erecta, ramosa, ramulis virgatis, striatis, junioribus puberulis, demum glabris, spina brevissima acuta reflexa infra petiolum armatis; foliis elliptico-oblongis, imo apiceque rotundatis, summo emarginatis et mucronulatis, marginibus revolutis, coriaceis, penninerviis, nervis obliquis marginem versus arcuatim nexis, utrinque minutissime glanduloso-rugosis, et sparsim cinereo puberulis; petiolo brevissimo, pubescente: racemis ♂ supra-axillaribus, 1-2, puberulis; pedunculo brevi, pedicellos paucos confertim approximatos imo bracteolatos 1-floros gerente; floribus parvis; sepalis 4, obovatis, imo concavioribus, extus pilosis, 2-serialiter imbricatis; petalo glabro; anthera 8-10-loba.—In Africa australi extratropica: v. s. in herb. Burch. (Cat. 1795 aut Cat. Geogr. 2529); in herb. De Boissier (Burch. Cat. Geogr. 2529, 2369); in herb. DC. (Burch. Cat. 2369).

This is a small erect shrub, apparently not more than a foot high, with internodes 4-9 lines long; the leaves, pale above, pallidly glaucous beneath, are 5-10 lines long, 3 lines broad, with nearly parallel sides and rounded extremities, the petiole being scarcely  $\frac{1}{4}$  line long, with a curved reflected spine of equal length. The raceme is 3 lines long, bears three to five divaricated pedicels  $\frac{1}{2}$  line long, with an oval bract at base one-fourth of its length; the flower, cruciately expanded, is 2 lines in diam.; the sepals are glabrous within, the filament being half their length.

2. *Antizoma Burchelliana*, nob.;—subscandens, ramulis teneribus, pubescentibus, spina infrapetiolari valida obtusa subreflexa petiolo  $\frac{1}{4}$  brevior armatis; foliis lanceolatis, fere a basi summum versus gradatim angustioribus, utrinque obtusiusculis, apice mucronulatis, marginibus subsinuatis vix revo-

lutis, utrinque viridibus et subnitentibus, sparse puberulis, subrugulosis, penninerviis, nervis paucis, teneribus, intra marginem arcuatis, reticulatis; petiolo subbrevis costaque mediana cano tomentosus.—In Africa australi: *v. s. in herb. Burch.* (Cat. 1795 bis).

This plant differs from the preceding in its slender, scandent, flexuose branches, with internodes  $\frac{3}{4}$ – $1\frac{1}{4}$  inch long; the leaves are much larger, being 2– $2\frac{1}{4}$  inches long, and  $\frac{1}{2}$ – $\frac{5}{8}$  inch broad; the petiole is  $\frac{3}{8}$  inch long; the very obtuse subrecurved spine is about 1 line long.

3. *Antizoma Harveyana*, nob.;—caule erecto, subscandente, ramis virgatis, striatis, glabris, spiniferis, spina infrapetiolari, acuta, uncinato-reflexa, petiolo 2-plo longiore; foliis lanceolatis, basi subobtusis, summum versus angustioribus, gradatim acutis, apice obtusiusculis et mucronato-cuspidatis, imo triplinerviis, crassiusculis, adultis utrinque glabris, marginibus revolutis, subtus cano-vel griseo-glaucis; petiolo brevissimo: racemo ♂ axillari, solitario, petiolo 2-plo longiore; floribus paucis, subcapitato-congestis; pedicellis 1-floris, brevissimis, imo bracteolatis; sepalis rhomboideo-rotundis, extus pilosis; petalis glabris; anthera 4-loba.—In Africa australi intertropica: *v. s. in herb. Hook.*, Crocodile River (Burke).

This species is sufficiently distinct from the two preceding. It appears to have a simple and erect stem, without any tendency to become scandent; the stem is flexuose, with internodes 5–8 lines long, and infrapetiolar spines scarcely a line in length: its leaves are 10–18 lines long, 2–3 lines broad, on petioles scarcely 1 line long; the peduncle is 1 line long, with an almost capitate head of few flowers, 1 line in diameter; the flower in bud is  $\frac{1}{4}$  line in diam.; its four sepals are fleshy, glabrous inside; its cup-shaped corolla has a slightly 4-lobed border; the filament, which scarcely exceeds it in height, bears a 4-lobed, 4-celled anther.

4. *Antizoma angustifolia*, nob.;—*Cissampelos angustifolia*, *Burch. Trav.* i. 389; *DC. Prodr.* i. 102;—subscandens, caule valde flexuoso, striato, glabro, spinifero, spina infrapetiolari, petiolum æquante, valde obtusa, deflexa; foliis late linearibus, imo obtusis, apice rotundatis, sæpe emarginatis, mucronatis, coriaceis, sub lente rugulosis, marginibus revolutis, utrinque glaberrimis et pallide glaucis, fere enerviis; petiolo brevi: pedunculis ♀ binis, axillaribus, brevissimis, glabris, 1-floris.—In Africa australi extratropica.—*v. s. in herb. Burch.* (Cat. No. 1717).

The stem is slender, very flexuose, with internodes  $\frac{3}{4}$ –1 inch

long; the petiole is 1 line long; the very deflected spine is extremely obtuse, almost truncated, 1 line long; each peduncle is  $\frac{1}{2}$  line long, thickened at its apex, and glabrous; the two opposite sepals are ovate, subacute, extremely concave, very fleshy, more concave at base, glabrous,  $\frac{1}{2}$  line long; the two petals are placed at the foot of the ovary, opposite the sepals, are orbicular, fleshy, one-fourth the length of the sepals; the ovary is somewhat shorter than the sepals, glabrous, conico-oblong, with an almost obsolete 2-lobed stigma at its apex.

5. *Antizoma Lycioides*, nob.;—*Cissampelos angustifolia*, E. Meyer (non Burch.), *Linnaea*, xix. 601 (*sine descr.*);—erecta, ramosa, ramis ramulisque alternis, virgatis, divaricatis, glaberrimis, angulato-striatis, spiniferis; spinis brevissimis, obtusis, fere glandulæformibus; foliis alternis vel in axillis superioribus fasciculatis, spathulato-linearibus, apice obtusis et mucronatis, coriaceis, enerviis, glaberrimis, utrinque cano-glaucis, sub lente rugulosis, marginibus incrassatis et revolutis; petiolo brevi: racemis ♂ axillaribus, 2–3, fasciculatis, pubescentibus, flores 3–4 brevissime pedicellatos subcapitados gerentibus; sepalis 4, ovatis, breviter unguiculatis, extus puberulis; petalo cupuliformi, crenulatum 4-lobo, glabro; anthera peltatum 4-loba.—In C. B. Sp.: *v. s. in herb. Hook.* (Drège); *in herb. De Boissier* (Zeyher, No. 11).

This plant is certainly distinct from the *Cissampelos angustifolia* of Burchell, to which it was referred by Dr. Meyer. It has an erect stem, with virgate knotted branches and slender, rigid, striated, divaricated branchlets  $\frac{1}{4}$  inch apart, almost spiny at the apex, and crowded with small leaves; the leaves are 6–9 lines long,  $1\frac{1}{2}$ –2 lines broad, on a petiole about  $\frac{1}{2}$  line long; they are covered on both sides with a whitish bloom, but are quite glabrous. The specimen in M. de Boissier's herbarium is taken from a much branched and knotty plant, with quite the habit of a *Lycium*; its very woody primary and secondary branchlets stand at an angle of from  $45^\circ$  to  $60^\circ$ , the latter being  $1\frac{1}{2}$  inch long; the leaves are fasciculated, as in Drège's specimen. The peduncles are 1 or 2 lines long, each bearing at its summit three or four approximated 1-flowered pedicels  $\frac{1}{2}$  line long, bracteolated at base, so that the flowers appear in a capitate head; the flower expanded is  $\frac{3}{4}$  line in diameter.

## 27. DISSOPETALUM.

This genus is proposed for a species belonging to Mauritius and Madagascar, long since known, but imperfectly examined—

the *Cissampelos Mauritiana* of Thouars, a plant not common in collections; but which has been much confounded with others of African and Asiatic origin. It differs from *Cissampelos* in its female flowers, which have two distinct petals, placed one on each side of a single sepal, so that they alternate with the latter, and a solitary ovary. This is admitted by Thouars in his original description of the typical plant, where he says the corolla is 2-lobed. In *Antizoma* we also find two petals; but then there are two sepals placed immediately behind and opposite to them, and a single ovary. In *Homocnemis* there are four sepals, four petals, also with a solitary ovary; while in *Ileospermum* we find three sepals, and three petals, placed round a central ovary, as in *Stephania*. In the two former the structure of the male flower is like that of *Cissampelos*; in the two latter it is unknown. In order, therefore, to maintain consistency in so extensive a genus as *Cissampelos*, it becomes necessary to maintain the several genera above mentioned; and *Dissopetalum* claims as high a title to distinction as any of them. Its structure must not be confounded with a peculiar anomaly I have observed in one species of *Cissampelos*, which might easily be mistaken for a *Dissopetalum*; it occurs in *C. testudinaria* from the Galapagos, where the petal appears double, owing to its being deeply cleft into two equal segments; but on attentive examination it is seen that the two segments are scated upon a single claw, fixed to the base of the sepal; the two lobes of the petal are therefore quite anterior and opposite to the sepal, not lateral and alternate with it as in *Dissopetalum*. It is probably to this exceptional case that the authors of the 'Flora Indica' allude when they affirm (p. 198) that they have several times seen the petal in *Cissampelos* "bipartite to the base." I have carefully examined and drawn the analyses of many hundreds of flowers of *Cissampelos*, but, with the exceptions above mentioned, I have invariably found only a single complete petal fixed to the claw of a single sepal. There is seen in the genus *Peraphora*, which will shortly follow, another anomalous departure from the normal structure of *Cissampelos*: in the ♂ flower there are no petals, and a campanular sepal, and in the ♀ two equal saccate sepals, without any petal, with an ovary in the centre.

The name of the genus under consideration is derived from the feature of its twin petals; its characters, as far as they are known, are thus enumerated:—

**DISSOPETALUM**, nob.—*Flores* dioici. *Masc.* omnino *Cissampelidis* structura.—*Fœm.* *Sepalum* unicum, oblongum, subcarnosum. *Petala* 2, æqualia, dimidio breviora, late orbicularia, imo breviter unguiculata, sepalo utrinque lateralia. *Stamina*



nulla. *Ovarium* oblongum, gibbum, 1-loculare, 1-ovulatum. *Stylus* longiusculus, erectus. *Stigma* trifidum, laciniis acutis, reflexis. *Fructus* ignotus.

*Frutex Madagascariensis et Mauritiana, scandens; folia subpeltata, subcordata, suborbicularia vel ovata, petiolo limbo subæquilongo; paniculæ ♂ axillares, plurimæ, fasciculatæ, composite ramosæ, et corymbosæ, necnon cum ramulo florifero racemiformi; flores minuti: racemi ♀ axillares, petiolum excedentes, bracteati; bracteæ foliiformes, floribus 5-9 pedicellatis fasciculatis minimis donatæ.*

*Dissopetalum Mauritianum*, nob.; — *Cissampelos Mauritiana*, Thouars (non Wall.) in *Desv. Jo. Bot.* ii. 65, tab. 3 et 4; *DC. Syst.* i. 535; *Prodr.* i. 101; — *Cissampelos Pareira*, Hook. & Th. (non Linn.) *Fl. Ind.* i. 198; — ramis teretibus, contortim striatis, puberulis; foliis subpeltatis, suborbicularibus aut fere reniformibus, sinu subangustato cordatis, apicem versus vix angustioribus, rotundatis, emarginatis et aristato-mucronatis, e basi 5-7-nerviis, supra puberulis, in nervis tenuibus cano pilosis, marginibus flavido lanatis, subtus cano tomentosus, nervis vix prominulis, petiolo tomentoso, limbo æquilongo vel longiore: floribundum, paniculis ♂ 6 vel plurimis in axillis fasciculatis, pubescentibus, petiolo brevioribus, a basi late ramosis et dichotome divisis; sepalis obovatis, extus pilosis, lineis obliquis guttatim pictis; petalo parvo, cyathiformi, integro, glabro, radiatim guttato, anthera 4-loba: racemo ♀ axillari, folio adjecto petiolo æquilongo, spicatim bracteato; bracteis foliolosis, vix imbricatis, suborbicularibus, velutinis; floribus 7-9 in axillis fasciculatis, pedicellatis; sepalo elliptico, utrinque subacuto, extus hirsutulo; petalis utrinque lateralibus, dimidio brevioribus, orbicularibus, breviter unguiculatis, extus paulo pilosis; ovario extus hirsuto, dorso glabro.—In insulis Madagascar et Mauritio: *v. s. in herb. Mus. Brit. et Lindl.* ♂, Madagascar (Forbes); *in herb. Lindl.* ♀, Madagascar (Bouton); *in herb. Hook.* ♀, Mauritius (Bojer).

With this plant botanists have confounded *Cissampelos convolvulacea*, DC., *Pericampylus incanus*, and other Indian plants; in habit it bears a general resemblance to them. It appears confined to the islands of the Madagascar group. De Candolle states, on the authority of Thouars, that the leaves are peltate in the ♂ and palate in the ♀; but this is contradicted by the drawings of the latter, and I have not found any such sexual difference. They are almost as broad as they are long,  $2\frac{1}{2}$ - $3\frac{1}{2}$  inches in diameter, the depth of the basal sinus being from 3 to 5 lines; the petiole is  $2\frac{1}{4}$  inches long in the ♂, and  $1\frac{3}{4}$ -2 inches long in the ♀, and is inserted  $\frac{1}{2}$  line within the margin of the

sinus. Numerous fasciculated ♂ panicles, shorter than the petiole, are crowded in the principal axils, each with a short peduncle and many elongated, divaricated, approximated, and alternate branches, which are severally again divided, often forming an entangled mass of flowers; the length of these panicles is  $1\frac{1}{2}$  inch, their ramifications generally  $\frac{1}{2}$ – $\frac{3}{4}$  inch long: the ♀ raceme is 3–4 inches long, having sometimes one or two somewhat remote basal leaves  $\frac{1}{2}$  inch in diameter; but the approximated floral bracts, with a long mucronated point, are 2 lines in diameter.

### 28. CLYPEA.

This genus was established by Blume, in 1825, upon six species from Java; but only one of these is congeneric with his type, the rest belonging to Loureiro's genus *Stephania*, with which he does not seem then to have been acquainted. Wight and Arnott, in their 'Prodrömus,' placed all the species of *Stephania* in *Clypea*, while, contrariwise, the authors of the 'Flora Indica' merged the latter genus into *Stephania*, on the ground that the number of its floral parts is inconstant. In this opinion they were supported by Prof. Asa Gray, who stated that he found in *C. Forsteri* trimerous as well as tetramerous flowers on the same plant. I have since examined the ♂ flowers of the same species, which were kindly sent to me by Dr. Asa Gray, and found most of them regularly tetramerous, while the others were more or less irregularly affected by metamorphic influence; but in no one instance was I able to detect the decidedly trimerous structure of *Stephania*\*. I obtained similar results from the typical specimens, now in the British Museum, collected by Forster and Solander. Additional evidence of the tetramerous or dimerous

\* In one head of twelve ♂ flowers, it appeared to me that there were six which had each eight sepals, four petals, and one stamen, one with nine sepals and five petals, one with seven sepals and four petals, one with six sepals and four petals, one with seven sepals and three petals, and one double flower with fourteen sepals, eight petals, and two stamens, one of which was much dwarfed: hence there existed, in all, twelve stamens, forty-eight petals, and ninety-one sepals, averaging for each flower the number of more than seven and a half sepals, four petals, and one stamen. If account had been taken of the rudimentary parts, dwarfed to a size so minute as to escape ordinary observation, the full normal proportion of floral parts would be complete. In this species the sessile flowers are so closely compacted upon the fleshy disk, that it is almost impracticable to separate them without confounding some parts of one with those of another; the only sure mode of analysis is therefore to count the whole number of parts in one capitulum, and take their average. In other species (for instance, in *C. oxyphylla*), where the flowers are approximated, not agglutinated together, and therefore easily separable, the floral parts are constantly and unquestionably tetramerous.

structure in *Clypea* is afforded by the structure of its ♀ flowers, which Dr. Gray does not appear to have seen: these have each four sepals, two petals, and one ovary, with two stigmata, each bifid\*; while *Stephania* has three sepals, three petals, and an ovary with three or six stigmata. We have also a different development of the putamen in *Clypea*, where the hippocrepical ring that forms the seminal cell has externally upon each face a single series of centrifugal spines, which stand out beyond the flattened edge that forms the periphery of the cell; whereas in *Stephania* there is a double series of tubercles on each side; moreover in *Clypea* the condyle is a plane or slightly concave entire disk, which is not perforated in the middle, the latter character being peculiar to *Stephania*. I have found these characters constant in all the six species here enumerated; so that we have sufficient evidence to maintain the right of *Clypea* to rank as a good and distinct genus.

All the plants of *Clypea* have deeply peltate leaves, as in *Stephania* and *Cissampelos*. The inflorescence is dichotomously branched, or more frequently simply or repeatedly umbellate, as in *Stephania*; but very often, as just stated, the ultimate rays and pedicels become confluent into a disciform tumescence at the summit of the umbel, on which the flowers are sessile and closely aggregated into a subglobular head—a circumstance which probably suggested the name of *Clypea*, as this agglutination is very conspicuous in Blume's typical species, *C. acuminatissima*. When the plants and flowers are pubescent, the hairs are all articulated.

CLYPEA, Blume.—*Flores* dioici. *Masc.* *Sepala* 8, biseriata, spatulato-oblonga, apice rotundata vel truncata, lateribus interdum undulatis, sæpe pilis articulatis extus vestita, æstivatione subimbricata. *Petala* 4, cuneato-obovata, sepalis 4-plo vel dimidio breviora, iis opposita, carnosula, glaberrima. *Stamen* unicum, centrale; *filamentum* subbreve, erectum; *anthera* 4–8-locellata, locellis circa connectivum peltatum in anulum connexis, rimis totidem horizontalibus bivalvatim dehiscentibus et sæpe minime interruptis suturam continuam simulantibus. —*Fœm.* *Sepala* 4, spatulato-oblonga, glabra. *Petala* 2, spatulato-oblonga, dimidio minora, glabra. *Stamina* nulla.

\* In the ♀ inflorescence of *C. Forsteri*, the flowers are agglutinated together upon a fleshy mass, as in the ♂; so that it is as necessary to analyze the whole capitulum as if it were a single flower. In this way I found in a single ♀ head fourteen ovaries and eighty-four floral scales, of which one-third were smaller and darker than the remaining more membranous two-thirds, which gives four sepals and two petals to each ovary.

*Ovarium* unicum, valde gibbosum, 1-loculare, 1-ovulatum. *Stylus* nullus. *Stigmata* 2-4, subsessilia, recurvatim divaricata. *Drupa* carnosae, gibba; *putamen* *Cissampelidis* et eo *Stephaniae* diversum, *condylo* imperforato notatum.

Frutices scandentes, in India, in Japonia, in insulis Asiaticis et Sandvicensibus crescentes; folia peltata, oblonga vel suborbicularia, subcordata, apice saepius acuta, petiolata, glabra vel pubescentia; inflorescentia in utroque sexu axillaris; pedunculus saepius solitarius, simpliciter vel iterum umbellatus; flores numerosi, minuti, puberuli, crebre capitato-aggregati, plerumque e pedicellis confluentibus in discum carnosum conglutinati.

1. *Clypea acuminatissima*, Bl. Bijdr. 26;—*Stephania acuminatissima*, Walp. Rep. i. 96;—ramis teretibus, angulato-striatis, glabris; foliis profunde peltatis, oblongis, imo orbicularibus, a medio sensim attenuatis et longe acuminatis, mucronatis, 10-nerviis, utrinque pallidis et glaberrimis, supra subnitidis, subtus sordide glaucescentibus, nervis prominulis; petiolo tenui, limbo 3-plo brevior, striato, glabro: paniculis ♂ in axillis solitariis aut pluribus fasciculatis, umbellatis, brevibus, glaberrimis; pedunculo tenui, petiolo 4-plo brevior; umbellis circiter 8, aequalibus, singulis flores numerosos sessiles minutos in capitulum semiglobosum supra discum peltatum crebre congregatos gerentibus; sepalis cuneato-oblongis, apice dilatato et hic ad marginem inciso-crenatis, submembranaceis, nigro punctulatis, glabris; petalis 4-plo brevioribus, cuneato-rhomboides, carnosulis, opacis, apice crenulatis; anthera globosa, apice umbilicata, 4-locellata, locellis rima horizontali valvatim hiantibus.—In Java: v. s. in herb. Hook. (Lobb).

This is Blume's typical species, and is certainly well distinguished from the others. The axils are about 3 inches apart; the leaves are 4 inches long,  $2\frac{1}{4}$ – $2\frac{1}{2}$  inches broad, on a petiole  $1\frac{1}{2}$  inch long, fixed about 9 lines within the basal margin: the peduncle is 5 lines long, its umbellate branches 3–5 lines long, each bearing a semiglobular head of numerous flowers upon a peltate disk flat beneath,  $1\frac{1}{2}$ – $1\frac{3}{4}$  line in diameter; the sepals are  $\frac{1}{3}$  line long; filament the same length.

2. *Clypea oxyphylla*, nob.;—ramis contortis, teretibus, striatis, patentim mollissime puberulis; foliis profunde peltatis, imo rotundatis, mox valde angustatis, apice longe acuminatis, acumine angusto, obtusulo et mucronato, 10-nerviis, marginibus e nervo circumambiente subrevolutis, supra nitidis, reticulatis, glabris (nervis puberulis exceptis), subtus pallide

glaucis, pilis articulatis molliter puberulis, nervis rubescentibus; petiolo tenui, striato, puberulo, rufulo, limbo dimidio brevioribus: paniculis ♂ axillaribus, solitariis, umbellatis, puberulis; pedunculo tenuissimo, petioli dimidio longitudine; umbellis circiter 6, pedunculo dimidio brevioribus, imo bracteolatis; umbellulis circiter 7, umbello 6–8-plo brevioribus, imo bracteolatis, apice flores 15–18 in capitulum globosum aggregatos gerentibus; floribus parvis, valde distinctis, brevissime aut subobsolete pedicellatis; sepalis 8, spatulato-oblongis, integris, extus in nervo puberulis; petalis 4, parvis, orbiculatis, unguiculatis, glabris; anthera compressa, 8-loba, connectivo majusculo peltiformi.—In Nepalia: *v. s. in herb. De Candolle* (Wall. anno 1821).

This plant resembles the typical species in the size and shape of its leaves; but they are tomentose beneath: it also differs in its inflorescence, its very distinct flowers, the shape of its floral parts, and other particulars. The internodes are 2–2 $\frac{3}{4}$  inches long; the leaves are 4–4 $\frac{3}{4}$  inches long, 2–2 $\frac{3}{4}$  inches broad, on a petiole 1 $\frac{3}{4}$ –2 inches long, which is inserted 9 lines within the basal margin. The peduncle is 10–12 lines long, the umbels 5–6 lines, the umbellules  $\frac{3}{4}$ –1 line, the globular heads 1 $\frac{1}{2}$  line in diameter.

3. *Clypea effusa*, nob.;—ramulis teneris, striatis, glabris; foliis peltatis, deltoideo-oblongis, imo rotundiusculis aut sinu levissimo truncatis, a medio gradatim angustioribus, apicem versus subconstrictis, acumine sæpe obtusulo, 10–12-nerviis, utrinque glaberrimis, supra pallide viridibus, subtus pallidioribus, in junioribus subcanescentibus; petiolo tenuissimo striato, glabro, limbo brevioribus: panicula ♂ axillari, glaberrima; pedunculo petiolo paulo brevioribus, iterum umbellata; umbellis 5–6, fere dimidio brevioribus, inæqualibus, compressis, striolatis, tenerrimis; umbellulis 3, brevissimis, apice flores plurimos capitato-corymbosos gerentibus; floribus brevissime pedicellatis et bracteola elliptica donatis; sepalis 8, biserialiter subæqualibus, oblongis, integris, fusco-membranaceis, glaberrimis; petalis constanter 4, brevioribus, cuneato-orbicularibus, carnosulis, glabris; anthera 8-loba.—In Malabar: *v. s. in herb. Hook.* ♂ et ♀, Kurg (Hook. & Th.).

This is a species with much smaller, less acuminate, quite glabrous leaves, on very slender petioles. The branchlets are very slight, with internodes 2 $\frac{1}{4}$  inches long; the leaves are 2 $\frac{3}{4}$ –3 $\frac{1}{4}$  inches long, 2 $\frac{1}{8}$ –2 $\frac{3}{8}$  inches broad, on an almost filiform petiole 1 $\frac{3}{4}$ –2 $\frac{1}{2}$  inches long, inserted 4–6 lines within the basal margin. The ♂ peduncle is  $\frac{3}{4}$ –1 inch long, the umbels 6–11 lines long, unequal in length, nearly erect, each with a setiform bract at

base 1 line long; the umbellules are 1–3 lines long, or are sometimes much shorter, are surmounted by a corymbulose head of flowers, which are larger than in the preceding species, on pedicels 1 line long, furnished with a somewhat shorter bracteole; the eight sepals, quite glabrous and membranaceous, are 1 line long, the four petals being  $\frac{1}{2}$  line long and broad.

4. *Clypea Forsteri*, nob.;—*Cocculus Forsteri*, *DC. Syst.* i. 517, *Prodr.* i. 96; *Guillem. Zeph. Tahit.* p. 76;—*Stephania Forsteri*, *A. Gray, in Bot. Wilkes. Exped.* i. 36;—*Menispermum Japonicum*, *Forst. (non Thunb.) Fl. Ins. Austr.* p. 71 (edit. 1771);—*Menispermum peltatum*, *Soland. (non Lam.) Primit. Fl. Ins. Oc. Pac.* 343 (edit. 1769); *Parkinson, MS. Plant. Otah. (ined.)* ii. p. 114;—ramulis striatis, glabris; foliis profunde peltatis, deltoideo-orbicularibus vel ovalioribus, imo rotundiusculis et truncatis, vel sinu levissimo lato obsolete cordatis, a medio sensim angustioribus, apice acutis vel obtuse acuminatis, mucronulatis, 10–12-nerviis, supra læte viridibus, valde reticulatis, nitidiusculis, utrinque glaberrimis, marginibus subrevolutis, subtus pallide vel flavide glaucis, nervis venisque brunneis, tenuibus, vix prominulis; petiolo tenui, striolato, glabro, imo tortulo et tumidulo, in ♂ limbo multo brevior, in ♀ limbo æquilongo vel longiore: panicula ♂ axillari, umbellata, glaberrima vel pilis patentibus articulatis puberula; pedunculo tenuissimo, petioli fere longitudine; umbellis 7–9, pedunculo 8-plo brevioribus; floribus minimis, capitato-congestis: panicula ♀ simillima; pedunculo filiformi, petiolo 3–4-plo brevior; umbellis 5–6, brevibus, capitulis 12–15-floris; floribus sessilibus, creberrime aggregatis; sepalis 4; petalis 2; ovario glabro; putamine radiatim spinuloso, condylo imperforato.—In insulis Societatis: *v. s. in herb. Mus. Brit.* ♂, Tahiti (Solander); ♀, Tahiti (Forster, planta typica), *ib.* (Banks and Solander); *in herb. Hook.* ♂, Tahiti et Tongataboo (Wilkes).

This species is fully described by Solander in the unpublished manuscript work above referred to, and is illustrated in a volume of beautiful coloured drawings, also unpublished, both existing in the British Museum, Solander's original specimens being there also preserved. Forster, who accompanied Capt. Cook on his second voyage, collected another specimen, also existing in the Museum herbarium, and which he referred to Thunberg's plant. The species differs from all the preceding in its larger and more orbicular leaves, remarkable for their very elongated petiole in the ♀ specimens, which is much shorter in the ♂. The leaves are  $3\frac{1}{4}$ – $5\frac{1}{4}$  inches long,  $3\frac{1}{2}$ – $4\frac{3}{4}$  inches broad, on a petiole 2– $2\frac{1}{4}$  inches long in the ♂, and  $4\frac{1}{2}$  inches long in the ♀. The ♂ peduncle is  $1\frac{1}{2}$ –2 inches long, the umbels 3 lines long;

the ♀ peduncle is  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long, the umbels 3–6 lines long. Dr. Gray has referred the species to *Stephania*; but its imperforate condyle shows that it belongs to this genus.

5. *Clypea consummata*, nob.;—ramulis teretibus, angulato-striatis, ad nodos compressis, contortis, glabris; foliis peltatis, deltoideo-ovatis, imo subrotundis, ultra medium angustioribus, summum versus paulo constrictis, acumine latiusculo obtuso et emarginato, 12-nerviis, utrinque glabris, supra lucidis, viridibus, nervis prominulis, reticulatis, subtus cinereoglaucis, nervis fuscis; petiolo valido, compresso, striato, limbo subæquilongus vel longiore: panicula ♀ axillari, umbellata, glabra; pedunculo tenerrimo; umbellis circiter 8, triplo brevioribus; floribus circa 9, in discum carnosum ex umbellulis coalitis creberrime sessilibus et hinc globoso-capitatis; sepalis et petalis fere consimilibus, oblongo-ovatis, submembranaceis, glabris; ovariis ovatis, sessilibus, glabris; stigmatibus 4, subulatis et subreflexis.—In Japonia: v. s. in herb. Hook., Nagasaki (Oldham, 760).

A very distinct plant, with an entirely glabrous habit, in which respect it resembles the two preceding species; but it differs from them in several particulars. Its nodes are very distant; the leaves are  $3\frac{1}{2}$ – $4\frac{3}{4}$  inches long,  $2\frac{3}{4}$ – $3\frac{1}{2}$  inches broad, on a stout and very compressed petiole,  $4$ – $4\frac{1}{2}$  inches long, which is inserted 1 inch within the basal margin. The very slender peduncle is  $2\frac{1}{4}$  inches long, its umbels 3–8 lines long; the petals and sepals are  $\frac{1}{3}$  line long, the ovary being a trifle longer: the number of floral parts in each capitate head is quite in harmony with the generic character, having fifty-four closely aggregated sepals and petals, and nine ovaries.

6. *Clypea subovata*, nob.;—ramulis teretibus, striatis, glabris; foliis peltatis, deltoideo-orbicularibus, imo sinu lævi subtruncatis, ultra medium sensim et curvatim angustioribus, apice obtusis, emarginatis, et mucronulatis, 10–12-nerviis, utrinque glabris, supra viridibus, nervis immersis, subtus cano-glaucis, nervis tenuibus et paulo prominulis, reticulatis; petiolo paulo compresso, imo fuscescente, glabro, limbo dimidio brevior: panicula ♀ axillari, umbellata, glaberrima; pedunculo petiolo dimidio brevior, umbellis circiter 5, umbellulis 5, brevissimis, capitulis confertim paucifloris; drupis glabris.—In Japonia: v. s. in herb. Hook., Rino Ohosimo (Oldham, 346).

This species differs from the preceding species in its much smaller, rounder, more obtuse leaves, with much shorter petioles, and a shorter inflorescence, with fewer umbels. The leaves are

3 inches long,  $2\frac{3}{4}$  inches broad, on a petiole  $1\frac{1}{2}$ –2 inches long, inserted  $\frac{3}{4}$  inch within the margin of the basal sinus. The peduncle of the ♀ inflorescence is 1 inch long, its umbels 4–6 lines long. The specimen is in fruit only, the drupes being 3 lines long; and the putamen has an imperforate condyle.

7. *Clypea meridiana*, nob. ;—ramulis teneris, subpuberulis; foliis profunde peltatis, deltoideo-ovatis, imo valde rotundis, ultra medium gradatim angustioribus, acutis, mucronatis (in ♀ minoribus et suborbicularibus), 12-nerviis, supra subnitidis, glabris, valde reticulatis, subtus flavide glaucis, puberulis, marginibus subrevolutis; petiolo subtenui, striato, puberulo, limbo dimidio brevioribus: panicula ♂ axillari, umbellata, pubescente; pedunculo tenui, petiolo paulo brevioribus; umbellis 5-plo brevioribus circiter 7; umbellulis circiter 8, pedicellos 3 fasciculatos 1-floros apice gerentibus; sepalis 8, biserialiter subæqualibus, cuneato-oblongis, membranaceis, omnino glabris; filamento brevi; anthera 8-loba: panicula ♀ axillari, umbellata; pedunculo petiolo paulo brevioribus; umbellis 6, dimidio brevioribus; umbellulis 4, apice pedicellis 3 fructiferis munitis.—In Caffraria: *v. s. in herb. Hook.* ♂ et ♀, Natal (Gerard, 1468), sub nom. "*Homocnemia Meyeriana*."

These are the specimens to which I have previously alluded (*ante*, p. 127), which I found affixed upon the same sheet as the typical specimen of *Homocnemia Meyeriana*, and supposed by the collector to be identical with it; but they are extremely different in all respects. It is the only African species of *Clypea* yet known, and is remarkable for being found as far beyond the southern tropic, as the two preceding species extend beyond the northern tropical zone. The internodes are  $3\frac{1}{4}$ –4 inches long; the leaves in the ♂ plant are  $3\frac{1}{4}$ –4 inches long,  $2\frac{1}{2}$ –3 inches broad, on a petiole  $1\frac{3}{4}$  inch long, inserted 9–10 lines within the orbicular basal margin: in the ♀ specimen they are 2– $2\frac{1}{2}$  inches long,  $2\frac{1}{4}$ – $2\frac{1}{2}$  inches broad, on a petiole  $1\frac{1}{4}$  inch long, inserted 7–9 lines within the margin. The ♂ peduncle is  $1\frac{1}{2}$  inch long, the umbels 3 lines, the umbellules 1 line, the pedicels  $\frac{3}{4}$  line long: the ♀ peduncle is 8 lines long, the umbels 4 lines, the umbellules 2 lines, the fructiferous pedicels  $1\frac{1}{2}$  line long; the putamen is 3 lines long,  $2\frac{1}{2}$  lines broad, with an imperforate condyle.

## 29. STEPHANIA.

This genus, proposed by Loureiro in 1793 for two plants of Chinese origin, was for a long time wholly neglected; at length it was acknowledged by botanists, and so far extended by some as to embrace Blume's genus *Clypea*; others, on the contrary,



under vague notions of its real characters, gave the preference to *Clypea*, and included in it all the species of *Stephania*. The authors of the 'Flora Indica' and of the 'Genera Plantarum' have united the two genera, on the authority of Prof. A. Gray, who placed little dependence on the constancy of their relative distinctions as I had defined them: his doubts arose from the examination of a plant considered by him to be identical with *Cocculus Forsteri*, DC., which had been referred to *Stephania*; it appeared to him that its floral parts were sometimes trimerous, at other times tetramerous, in the same specimen—an inference upon which I offered some remarks in speaking of *Clypea* (p. 204). In all the instances examined by me, which are extremely numerous, I have found, without exception, that the floral parts in the two genera are constantly distinct in number. *Stephania* in its ♂ flower has six sepals in two series, three smaller petals, and a 6-celled anther; while *Clypea*, as I have shown, has eight sepals in two series, four petals, and an 8-celled anther. In *Stephania* the ♀ flower has three sepals, three petals, and a putamen with a remarkable perforation in the middle of its disciform condyle; while in *Clypea* it has four sepals, two petals, and a putamen with an imperforate condyle, as in *Ileocarpus* and *Cissampelos*. Many good characters also separate this genus from *Homocnemia* and *Ileocarpus*: although the latter has a similar number of sepals and petals, the imperforation of its condyle renders it distinct; the former has four sepals and four petals in the ♀ flower, its fruit being unknown. Ignoring these well-marked distinctions, the authors of the 'Genera Plantarum' amalgamate *Clypea*, *Ileocarpus*, and *Homocnemia* with *Stephania*, and in the four genera thus confounded together they recognize only three species, whereas I have here enumerated, under well-defined characters, twenty-six species of *Stephania*, seven of *Clypea*, one of *Ileocarpus*, and one of *Homocnemia*, making in all thirty-five species. Much perplexity has arisen from the incomplete characters of the several species hitherto described by botanists, so that it has been difficult to reduce into consistent order many of the plants that have been referred to them; and, to add to this confusion, most of the specimens now existing in herbaria appear to have been named at hazard: no one seems to have taken the trouble to examine the structure of the flowers, in which, notwithstanding their minute size, good characters are found, corroborative of other features obtainable from the differences that exist in the leaves, petioles, and inflorescence.

The species are found chiefly on the Indian continent and the islands of its great archipelago, their range extending eastward as far as China, Japan, and Australia, and westward to the limit

of Africa: the genus is therefore quite foreign to the continent of America. It may be here observed that the hairs of the pubescence, whenever found in this genus, are short and articulated, as they are likewise in *Clypea*.

STEPHANIA, Lour.;—*Clypea*, *W. & A. (non Bl.)*;—*Cissampelos (in parte) auctorum*;—*Flores* dioici. *Masc. Sepala* 6, spatulato-oblonga vel linearia, biseriata, quorum 3 interiora latiora, membranacea, æstivatione imbricata. *Petala* 3, sepalis exterioribus opposita, cuneato-rotunda vel ovata, breviora, carnosula. *Stamen* unicum, centrale; *filamentum* teres, sepalis æquilongum vel brevius; *anthera* annularis, 6-locellata, ad marginem connectivi peltatim affixa, rima horizontali dehiscens.—*Fœm. Sepala* 3, cuneato-oblonga. *Petala* 3, subrotunda, subcuneata, carnosula. *Stamina* nulla. *Ovarium* ovatum, gibbum, glabrum, 1-loculare, *ovulo* solitario parieti appenso. *Stylus* subnullus. *Stigma* sessile, excentricum, inæqualiter 3-6-laciniatum; laciniis acutis, subreflexis. *Drupa* carnosula, glabra; *putamen* osseum, obovatum, valde compressum, 1-loculare, *loculo* peripherico et hippocrepiformi circa condylum voluto, utrinque seriebus 2 concentricis tuberculorum liris sæpe connexis extus armato; *condylus* excentralis, lamini-formis, discoideus, utrinque subconcaus, medio foramine distincto perforatus. *Semen* hippocrepiforme, dorso convexum, ventre subplanum; *integumentum* tenuiter membranaceum, linea longitudinali ad condylum affixum; *embryo* in *albumine* simplici carnosus, hippocrepiformis, tenuiter elongatus, teres, *cotyledonibus* semiteretibus, incumbentibus, *radicula* supera tereti ad stylum spectante, iis æquilonga et æquilata.

Frutices scandentes, in *Asia intertropica*, in *insulis adjacentibus*, necnon in *Australia et Africa crescentes*; radix sæpe tuberosa; caulis ramosus; folia alterna, profunde peltata, suborbicularia, deltoideo-ovata vel oblonga, integra vel sinuato-angulata, imo rotundata, truncata vel cordato-sinuata, palmatinervia, sæpius glabra: panicula in utroque sexu supra-axillaris, sæpe longissime pedunculata, umbellatim ramosa; umbellis iterum umbellulatis, multifloris; flores minuti, in capitulum dense aggregati, vel laxè corymbulosi.

1. *Stephania longa*, Lour. Coch. ii. 747;—*Cocculus Roxburghianus*, Wall. in parte (non DC.);—ramulis angulato-striatis, glaberrimis; foliis profunde peltatis, deltoideo-oblongis, imo late semiorbiculatis vel rotundatis, a medio gradatim acutis aut longiuscule acuminatis, acumine angusto, obtuso, mucronulato, 10-12-nerviis, utrinque glaberrimis, supra nitidis, viridibus, subtus cano- vel brunneo-glaucis, nervis venisque

reticulatis, paulo prominentibus, nervis circa petiolum membrana sæpe nexis; petiolo glabro, striato, limbo brevior: panicula ♂ umbellata, tomentosa; pedunculo petiolo dimidio vel triplo brevior; umbellis 6, paulo brevioribus; umbellulis 3, 4-plo brevioribus; pedicellis plurimis, fasciculatis, apice flores 3 sessiles gerentibus; floribus minutis pedicellisque in capitulum aggregatis; sepalis 6, spathulato-oblongis, extus subpuberulis; petalis 3, cuneatim deltoideis, fuscis, glabris; anthera exserta, 6-loba.—In India et China; Cochinchina (Loureiro): *v. s. in herb. Mus. Brit.* ♂, China (Stanton), hort. bot. Calc. culta (Roxburgh); *in herb. Soc. Linn.* ♂, hort. bot. Calcut. cult. (Wall. Cat. 4972 *h.*, *b, c*, non *A*, nec *B*, nec *C*); *in herb. Hook.* ♂, ad pedes montium Khasyæ (Hook. & Th.).

This plant, in the Wallichian collection, obtained from the Botanic Garden of Calcutta, was probably introduced there from China. It accords well with Loureiro's character; it is very distinct from the same numbers marked *A*, *B*, and *C* in Wallich's Catalogue. It may be recognized by its more deeply peltate leaves, semiorbicular at base, with the upper moiety in the shape of a long acute-angled triangle, more or less attenuated towards the summit, and upon a slender petiole, around which the nerves are united by a webbed membrane. It differs from *C. Japonica* in having a membrane at the origin of the nerves, and in its shorter petiole. The leaves are 3–4¼ inches long, 2½–2¾ inches broad, on a petiole 1¼–1¾ inch long, which is inserted 9–10 lines within the basal margin. The ♂ peduncle is ¾ inch long, the primary umbels ¾ inch long, the secondary rays 2 lines long; the sepals are membranous, nearly glabrous, clothed outside at base with a few articulated hairs.

2. *Stephania Japonica*, nob.;—*Cocculus Japonicus*, *DC. Syst.* i. 516, *Prodr.* i. 96;—*Menispermum Japonicum*, *Thunb. Jap.* 195; *Lam. Dict.* iv. 96;—*Clypea venosa*, *Bl. Bijdr.* 27;—*Stephania venosa*, *Walp. Rep.* i. 96;—ramulis teneris, contortim sulcato-striatis, glabris; foliis peltatis, deltoideo-oblongis, imo sinu levissimo truncatis vel rotundiusculis, a medio sensim angustioribus, apicem versus acuminatis, acumine angusto, acuto vel sæpe obtusulo, mucronato, 9–11-nerviis, reticulatis, utrinque glaberrimis, marginibus tenuibus revolutis, supra pallide viridibus, nitidis, subtus glaucis, opacis, nervis nitidis rufulis prominulis; petiolo valde tenui, limbo subæquilongo vel paulo brevior, striato, glabro, imo torto et tumidulo, apice fusco: paniculis in utroque sexu axillaribus, solitariis vel geminis, umbellatis, glabris; pedunculo tenui, petiolo brevior; umbellis 3–8 iterumque umbellulatis, ramulis ultimis flores numerosos minutos in capitulum

parvum aggregatos apice gerentibus; in ♂ sepalis 6, subæqualibus, oblongo-ovatis, membranaceis, glabris; petalis 3, dimidio brevioribus, cuneato-orbicularibus; in ♀ drupis glabris.—In Japonia, India orientali et insulis Philippinis: *v. s. in herb. Lindl. et aliorum*, ♂ et ♀ ins. Philipp. (Cuming, 1160); *in herb. Hook.* ♀, Kurg (Hook. & Th.); ♀, Concan (Gibson); ♂, Concan (Law), Ind. pen. ♂ et ♀ (Wight, 953).

The above specimens are referred here because they accord with the descriptions of the Japanese plant as given by De Candolle and Lamarck. They are all glabrous, with slender branches, and with leaves 3–3 $\frac{3}{4}$  inches long,  $2\frac{1}{4}$ –2 $\frac{3}{4}$  inches broad, scarcely sinuated at base, with a very slender petiole 1 $\frac{1}{2}$ –2 $\frac{1}{2}$  inches long, inserted 6–9 lines within the basal margin. The almost capillary ♂ peduncle is 1 $\frac{1}{4}$ –1 $\frac{1}{2}$  inch long; the umbels are 4–6 lines long; the sepals are ovate, somewhat narrower at both extremities, membranaceous, and glabrous; the drupe has a putamen with only eight radiating ridges on each side of the hippocrepical ring surrounding the perforated condyle.

3. *Stephania glaucescens*, Walp. Rep. i. 96;—*Clypea glaucescens*, Dcne. *Nouv. Ann. Mus.* iii. 423, tab. 18;—*Cocculus Japonicus*, var. *Timoriensis*, DC. *Prodr.* i. 96;—ramulis teneris, teretibus, striatis, glabris; foliis peltatis, deltoideo-orbicularibus, imo truncatis, a medio triangulatim angustioribus, apice acutis et mucronatis, 9–11-nerviis, utrinque glaberrimis, supra viridibus, subtus cano-glaucis, nervis extus ramosis venisque reticulatis paulo prominulis; petiolo tenui, glabro, limbo dimidio brevior: paniculis ♂ axillaribus, geminis vel solitariis, umbellatis, glaberrimis; pedunculo petiolo paululo brevior; umbellis 3–5, pedunculo 5-plo brevioribus, imo subbracteolatis; umbellulis 3–5, brevibus, flores numerosos in capitulum globosum apice gerentibus; sepalis 6, spathulato-oblongis, subæqualibus, glaberrimis, tenuiter membranaceis; petalis 3, carnosulis, margine tenuibus, suborbicularibus, 3-plo brevioribus; filamentis brevi; anthera 6-loba: panicula ♀ simillima, capitulis paucifloris; sepalis 3, lanceolato-oblongis, membranaceis; petalis 3, subrotundis; drupis glabris.—In insula Timor: *v. s. in herb. Lindl.* ♂, Timor (Decaisne).

This species differs from the preceding in its more orbicular leaves, on much shorter petioles, and in its shorter inflorescence. The leaves in the above typical specimen are 3 inches long, 2 $\frac{1}{2}$  inches broad, on a very slender petiole, 1 $\frac{1}{2}$  inch long, inserted 5 lines within the basal margin.

According to M. Decaisne, the leaves are acute and mucronated at the summit, 3–4 inches long, 2–3 $\frac{1}{2}$  inches broad, on a petiole nearly 3 inches long; but in the plate above cited they are much

smaller and obtuse at the apex, the largest leaf being  $2\frac{3}{4}$  inches long,  $2\frac{1}{2}$  inches broad, on a petiole  $1\frac{3}{4}$  inch long—dimensions which conform with the specimen I have seen. The slender ♂ peduncle is 11–15 lines long, the umbels 2–3 lines long, the umbellules  $\frac{1}{2}$  line, bearing a globular head 1 line in diameter, consisting of about one hundred very minute glabrous flowers. M. Decaisne considers this species to be similar to the *Clypea venosa* of Blume, with whose description Cuming's plant from the Philippine Islands well accords, and which I have referred to *Stephania Japonica*. The latter plant differs from that from Timor in its more slender habit, in its narrower, more oblong, and decidedly acuminate leaves upon much longer and far more delicate petioles, and a much more slender and more elongated panicle, with longer umbels in both sexes.

4. *Stephania rotunda*, Lour. (non H. & Th.) Coch. ii. 747; Hook. & Th. in parte, Fl. Ind. i. 197;—radice elongata, fusiformi, apice in tuber magnum, subrotundum, fuseum, epigæum dilatata; ramulis teretibus, striatis, glabris, nigrescentibus; foliis profunde peltatis, deltoideo-rotundatis, imo truncatis, vel sinu latissimo leviter subcordatis, a medio sensim angustioribus, apice acutis vix acuminatis, membranaceis, fuscis, utrinque glaberrimis, 9–11-nerviis, supra viridibus, nervis tenuibus vix prominulis, subtus paulo pallidioribus, cinereo-vel fusco-glaucis, nervis prominulis venisque rufescentibus aut nigrescentibus; petiolo tenui, striato, glabro, limbo subæquilongo: panicula ♂ axillari, umbellata, glaberrima, nigrescente; pedunculo filiformi, petiolo dimidio vel triplo brevioribus; umbellis 8–12, sextuplo brevioribus; umbellulis 4, crebre et alternatim 3–4-floris; floribus subnigris, brevissime pedicellatis, in capitulum congregatis; sepalis 6, glaberrimis, spathulato-oblongis, submembranaceis, nervo mediano fusco et extus ruguloso; petalis 3, cuneato-orbiculatis, imo carnosulis; anthera 6-loba.—In Cochinchina et Himalaya: v. s. in herb. Mus. Brit. ♂, Cochinchina (Loureiro); in herb. Hook. ♂, Kumaon (Thomson, 1227).

This species, well identified by the original type in the British Museum and by Loureiro's description, is distinct from many plants that have been referred to it by botanists. The authors of the 'Flora Indica' have confounded it with the *Cissampelos glabra* of Roxburgh, the *Cocculus Roxburghii* of Wallich (not of De Candolle), and with several other species here described. It differs from *S. glabra* in its smaller, dusky leaves upon much shorter petioles, and in its very short ♂ panicles with eglandular petals; from *S. glandulifera* for the same reasons and other obvious characters. It is evidently a somewhat succulent plant,

as it grows black in drying, and is remarkable for its large tuberous root, which is, perhaps, not of unfrequent occurrence in the genus and has been noticed in two other species; but there it is hypogeous, while here it is epigeous and is elongated beneath into a long fusiform root. Its very twisting branches are slender; the only full-grown leaf in the typical specimen is  $3\frac{1}{2}$  inches long, 3 inches broad; the petiole, which is incomplete, appears to have been nearly of equal length, and is inserted 6 lines within the margin of the very shallow basal sinus; in a young leaf on the same specimen, the petiole is about the length of the blade. The ♂ peduncle is 7 lines long, the umbels 2 lines long. I have referred here the specimen from Kumaon, which agrees well in the same characters: its leaves are  $3\frac{1}{4}$  inches long,  $3\frac{1}{2}$  inches broad, on a petiole  $2\frac{3}{4}$  inches long, inserted 9–10 lines within the basal margin; its peduncle is 7 lines, its umbels 2 lines long: its floral parts are similar, and all equally dark and glabrous.

5. *Stephania Roxburghiana*, nob. ;—*Stephania rotunda*, H. & Th. *in parte* (non Lour.) *Fl. Ind.* i. 197;—*Cocculus Roxburghianus*, DC. *Syst.* i. 516, *Prodr.* i. 96 (non Wall.);—*Cissampelos hexandra*, Roxb. *Fl. Ind.* iii. 841;—*Cissampelos Pata*, Buch. (non Roxb.);—*Cissampelos Finlaysoniana*, Wall. (*in parte*);—ramulis teneribus, teretibus, subglabris; foliis profunde peltatis, deltoideo-ovatis, imo rotundis vel truncatis, a medio angustioribus, apice subacutis vel obtusis et emarginatis, margine integro, 10-nerviis, supra glaberrimis, læte virentibus aut pallescentibus, venis reticulatis immersis, subtus cano-, flavido- vel thalassino-glauculentibus, opacis, nervis paulo prominulis, rarius subpuberulis, sæpius omnino glabris; petiolo limbo dimidio vel 3-plo brevior: panicula ♂ axillari; pedunculo petiolo brevior, apice 6-umbellato; umbellis pedunculo brevioribus; floribus globoso-capitatis: in ♀ umbellis pedunculo dimidio brevioribus, fructiferis cunctis longioribus.—In India orientali: v. s. *in herb. Mus. Brit.* ♀, sub *Ciss. hexandra*, Roxb. (species typica); ♀, *Ciss. Pata*, Buch. (non Roxb.); *in herb. Hook.* prope Pubna, Bengal (H. & Th.), Bunsal (Thwaites), Wall. Cat. 4977; *in herb. Soc. Linn.* ♀, Madras (Wall. Cat. 4977 *a*, non *b*); ♂ et ♀, Siam (ibid. 4974, sub *Ciss. Finlaysoniana*), Moulmeiu (ibid. 4977 *n*), Moulmein (Wall. 1291), Sylhet (Wall. Cat. 4977 *r*).

This species must not be confounded with the *Cissampelos hexandra*, Ham., in the Wallichian Collection (4977 *A* and 4977 *B*), which is *Stephania hernandifolia*. It is also very distinct from the *C. Roxburghianus*, Wall. The authors of the 'Flora Indica' doubt the validity of this species, established by

DeCandolle upon characters which the above diagnosis amply confirms. Wight and Arnott (*Fl. Penin.* i. 450) have not succeeded in clearing the confusion respecting it. It differs from *Stephania rotunda*, to which it has been referred as above cited, in its smaller leaves, often puberulous below, with a peculiar glaucous hue, and with shorter petioles, shorter panicles with subpuberulous flowers. From *S. hernandifolia* it differs in its shorter, broader, more trigonoid, not acuminate, leaves, which are generally glabrous, in its more glabrous flowers, for the sepals bear only a few hairs on the midrib, not altogether externally pubescent as in the other instance, and in its putamen, which is larger, has fewer crenulations, and a more expanded condyle with a larger perforation. The leaves are  $2\frac{3}{4}$ – $4\frac{1}{2}$  inches long,  $2\frac{2}{3}$ – $3\frac{1}{2}$  inches broad, on a petiole 11–18 lines long, inserted 6–9 lines within the basal margin; the peduncle is 9 lines long, with six umbellate pedicels 4 lines long.

6. *Stephania glabra*, nob.;—*S. rotunda*, *H. & Th. in parte* (non *Lowr.*) *Fl. Ind.* i. 198;—*Cissampelos glabra*, *Roxb. Fl. Ind.* iii. 840;—*Clypea Wightii*, *Arn. in Wight. Ill.* i. 22;—*Cocculus Roxburghianus*, *Wall. Cat.* (non *DC.*);—*Cocculus Finlaysonianus*, *Wall. Cat.*;—*alte scandens*, radice tuberosa, compresso-globosa, sæpe gigantea; caule brevi, mox ramoso, ramulis teretibus, sæpe tenuibus, profunde striatis, glabris; foliis sæpius majusculis, longissime petiolatis, profunde pel-tatis, deltoideo-orbiculatis, imo subrotundatis, a medio sensim angustioribus, apice obtusulis aut fere acutis, marginibus sæpe sinuato-angulatis, submembranaceis, 10–12-nerviis, nervis tenuissimis extus ramosis, venis inconspicuis, utrinque glaberrimis, supra opace viridibus, planis, subtus fulvido-glaucis, nervis venisque vix prominulis, valde reticulatis, nigrescentibus aut rubescentibus; petiolo tenui, sulcato-striato, subcompresso, glabro, limbo subæquilongo aut valde longiore: panicula ♂ supra-axillari, umbellata, glaberrima, elongata; pedunculo gracili, petiolo brevioris; umbellis 6–8, filiformibus, dimidio brevioribus, imo bracteolis totidem subulatis donatis; umbellulis 6, apice laxè capitato-corymbulosis; floribus alternatim longiuscule pedicellatis, parvis; sepalis 6, spathulato-oblongis, membranaceis, glabris; petalis paulo brevioribus, latoribus, cuneato-ovatis, crassioribus, glabris, glandulis 2 collateralibus elevatis intus ad medium notatis: panicula ♀ supra-axillari, umbellata, glaberrima; pedunculo brevi, umbellis 5–14 triplo brevioribus, compresso-striatis, apice dilatatis, iterum umbellatim brevissime 4–5-radiatis, radiis alternatim paucifloris et corymbulosis; sepalis nullis aut rarius unico (2 abortientibus); petalis 3, oblongis aut ovatis,

concavis, carnosulis; ovario glabro.—In India orientali: *v. s.* in *herb. Soc. Linn.* ♂, Nepal (Wall. Cat. 4972 B); ♀, Molung (ibid. 4972 A. b; ib. 4974 B), Sylhet (ib. 4972 c): in *herb. Hook.* ♀, Courtallam (Wight, 2462), Assam (Masters); ♂, Moulmein (Parish); ♂, Kumaon, Bagasor (Strach. & Wint.); ♀, Himalaya (Griffiths); ♂, Kumaon (Thomson, 1227), Courtallam (Griffiths); ♂, Gurwhal (Faulkner, 87).

The principal habitat of this species is in the Himalaya range extending from Tenasserim to Kumaon: it occurs also at Courtallam, on the south-western side of the Indian peninsula. It is a very distinct species, although regarded by the authors of the 'Flora Indica' as identical with *S. rotunda*: it differs, however, from it not only in its most conspicuous features, but in the marked characters of the biglandular petals in the ♂, and the frequent absence of sepals in the ♀ flower: it is distinguishable from *S. gracilentata* for the same reasons. In regard to one of its peculiar features just mentioned, it may be remarked that the normal numbers of floral parts in the ♀ flower of *Stephania* are three sepals and three petals, placed alternately in two whorls; but in this species one of the whorls is generally wanting. Roxburgh noticed the same fact, though he regarded the three existing parts as being one sepal and two petals; but, as they are in one whorl, and often alike in size, are concave, oval in shape, and subfleshy, like the petals in the ♂ flower, it may be considered that they are petals, and that consequently the sepals are wanting. The authors of the 'Flora Indica' (i. 197) suspect that Roxburgh had taken by inadvertence the flowers of their *Cyclea populifolia*; but it was not likely that so observant a botanist should have mistaken a long racemose inflorescence for a twice umbellated panicle. Roxburgh describes the tuberous root of this species to be round and often the size of a man's head. Parish's specimen above quoted is accompanied by a drawing and description, showing the tuber to be round, compressed, 4 inches in diameter, 2 inches deep, from the middle of which a stem,  $\frac{1}{2}$  inch in diameter, rises, which at the height of 4 feet from the ground throws out leaves  $7\frac{1}{2}$  inches long, on a petiole of equal length. In his specimen the branch is  $\frac{1}{8}$  inch thick, with axils 4–7 inches apart; the leaves are 4 inches long,  $3\frac{3}{4}$  inches broad, on a petiole 3 inches long, inserted 1 inch within the basal margin. In the specimen from Bagasor, the leaves are 6 inches long,  $5\frac{1}{2}$  inches broad, on a rather slender petiole  $10\frac{1}{2}$  inches long, inserted  $1\frac{1}{2}$  inch within the margin of the semiorbicular base. In Wallich's specimens from Molung and Nepal they are 5 inches long, the same in breadth, as are also those in Masters's plant from Assam: both are somewhat



sinuously lobed on the margin, the former with a petiole of 6 inches, the latter on one of 5 inches in length. The ♂ inflorescence is short compared with the petiole; the peduncle, however, though seldom exceeding 1-1½ inch, is 2 inches long in Parish's specimen, and both it and the umbels are compressed and striated. The ♀ inflorescence is similar in size and proportions; but by the time the fruit is matured both peduncle and umbels become much thickened.

7. *Stephania gracilentia*, nob.;—*Cissampelos hernandifolia*, Wall. (*in parte*);—ramulis gracilibus, striatis; foliis profunde peltatis, deltoideo-ovatis vel oblongioribus, imo sinu levi aut obsolete truncatis, sursum gradatim angustioribus, apicem versus breviter subconstrictis, acumine obtuso et mucronulato, submembranaceis, 8-10-nerviis, utrinque glaberrimis, reticulatis, subtus pallide vel cinereo-glaucis, nervis tenuibus, prominentibus, rufescentibus; petiolo tenuissimo, subcompresso, striato, glabro; imo tortuoso, limbo paulo brevior, vel rarius longiore: paniculis ♂ axillaribus, solitariis aut geminis, umbellatis, undique glaberrimis; pedunculo filiformi, petiolo subbrevisiore vel interdum longiore; umbellis 4-6, capillaribus, dimidio brevioribus, imo bracteolatis; umbellulis 4-6, alternatim laxifloris; floribus pedicellatis, hinc capitato-corymbulosis; sepalis 6, æqualibus, late cuncato-obovatis, membranaceis, glabris; petalis 3, paulo vel dimidio brevioribus, cuneato-orbicularibus, concavis, carnosulis; filamentis petala vix superante: panicula ♀ axillari, umbellata, glaberrima; pedunculo longissimo, filiformi; umbellis 6, filiformibus, fere æquilongis, imo bracteolis 3 munitis; umbellulis flores paucos alternatim pedicellatos gerentibus; sepalis 3, oblongis, submembranaceis, glabris; petalis 3, cuneato-orbiculatis; ovario glabro.—In Nepalia et regno Birmano: *v. s. in herb. Soc. Linn. Goyalpoor* (Wall. Cat. 4972 A. a); *in herb. Mus. Brit.* ♂, Nepal (Wallich); *in herb. De Candolle*, Nepal (Wallich): *in herb. Hook.* ♂ et ♀, Nepal (Wallich); ♂, Rangoon (McClelland); ♂, Martaban, Pegu (Scott).

This is a species readily distinguished from all others by its very glabrous habit, its extremely slender climbing branches, its very long filiform petioles, the elongated capillary peduncle of its umbellated panicle, its long capillary umbels, the secondary rays of which are laxly paniculated with flowers on comparatively long pedicels. It resembles some of the more slender specimens of *S. glabra* in the form of its leaves and general appearance, but is very distinct in its far more slender habit and both in its ♂ and ♀ inflorescence; it also differs in its ♀ flowers being furnished with the normal number of parts. Its leaves vary in size

in different specimens, being 3–4½ inches long, 2½–4¼ inches broad, on a petiole 3–6 inches long, inserted  $\frac{3}{4}$ –1¼ inch within the basal margin. The ♂ peduncle is 1¼ inch, sometimes even 4½ inches long, the umbels being 12–21 lines long, and their paniculated rays 3 lines long. The ♀ peduncle is 3 inches long, the umbels 4–6 lines, the linear acute bracts 3 lines long, the flowers being subagglomerated. The specimen from Rangoon has much smaller leaves, with very long petioles; its ♂ capillary peduncles and umbels are elongated in proportion: that from Martaban has its leaves more suddenly acuminate towards the summit, and somewhat rounder at base, 4¼–4¾ inches long, 3¾ inches broad, on a petiole 2½–3 inches long, inserted 10 lines within the margin; its ♂ peduncle is 2¼ inches long, its umbels 1½ inch, their umbellules 2 lines long, furnished with alternate pedicellated flowers, forming subcorymbulose heads.

8. *Stephania glandulifera*, nob.;—*Stephania rotunda*, Hook. & Th. (non Lour.) *Fl. Ind.* i. 197;—ramis lignosis, ligno striato et lurido, cortice brunneo, laxo, valde tuberculoso; ramulis sulcato-striatis, fuscis, tortis; foliis profunde peltatis, longissime petiolatis, subrotundis, imo rotundis vel sinu levi truncatis, ultra medium gradatim angustioribus, marginibus integris vel lobato-sinuatis, apice obtusis et mucronulatis, utrinque glaberrimis, 10-nerviis, supra fusco-opacis, subtus glaucopallidioribus; petiolo tenui, subcompresso, sulcato-striato, imo paulo incrassato et torto, limbo nonnihil longiore: pedunculo ♂ supra-axillari, petiolo dimidio brevior, apice umbellas 9–12 imo bracteolatas fulciete, quarum 3–6 iterum umbellulatae, in omnibus pedicellis brevibus imo bracteolatis 1-floris in capitulum aggregatis; floribus pro genere majusculis, siccis nigrescentibus; sepalis 6, æqualibus, spathulato-ovatis, crassiusculis, extus glanduloso-papillosis; petalis 3, paulo brevioribus, cuneato-orbicularibus, carnosissimis, valde concavis; filamentis petalis vix longiore; anthera 6-loba: pedunculo ♀ supra-axillari, petiolo dimidio longiore, validiusculo, compresso, apice dilatato; umbellis plurimis, iterum umbellulatis, vel ramis plurimis subsecundis plurifloris munitis; putamine 4-seriatim tuberculato, tuberculorum seriebus 2 periphericis, 2 alteris lateralibus, tuberculis erectis, apice late clavatis.—In Sikhim et Khasya: *v. s. in herb. Hook.* ♂ et ♀ (Hook. & Th.).

This is one of the several very distinct species amalgamated by the authors of the 'Flora Indica' with *S. rotunda*. It is easily recognized from all by the peculiar features above described: it is also distinguishable by the inflorescence becoming very black in drying. It is known in the country of Sikhim by the name of *Kuntea-pot*. The branches are covered with a lax

verruucose bark, the wood beneath being simply striated. The leaves are 3-4 inches long, 3-3½ inches broad, on a flattened petiole 4-4½ inches long, inserted 7-9 lines within the basal margin. The ♂ peduncle is 1½-2½ inches long, much flattened, narrow, ribbon-shaped, terminated by six filamentous umbels 3-6 lines long, each with from three to four umbellules 1½-2 lines long, and bearing a capitate head of few pedicellated flowers; pedicels 1½ line long; flower expanded 2 lines, all quite glabrous and black in drying; sepals six, spathulate-oblong, 1 line long, fuscous, covered outside at the apex with close papillose glands; petals three, ¾ line long, orbicular, with inflected margins, somewhat cuneate at base, dark, very fleshy; filament as long as the petals: in the ♀ flower the fructiferous peduncle is often 5 inches long, very dark, expanding gradually towards its summit to a breadth of 1½ line, where it has several umbels, varying in length according to the maturity of the ovules, flattened and dilated at the apex, and bearing several pedicellated drupes; the pedicels 2-3 lines long; the drupes 4 lines long, 3 lines broad; the putamen 3 lines long, 2½ lines broad, with long, erect, and singularly clavated tubercles; the condyle is perforated.

9. *Stephania appendiculata*, nob.;—ramulis teretibus, subspiraliter sulcato-striatis, glaberrimis; foliis profunde peltatis, deltoideo-oblongis, imo truncato-rotundatis, a medio sensim acutioribus, subacuminatis, acumine acutiusculo vel obtusulo, mucronato, 12-nerviis, utrinque glaberrimis, marginibus subreflexis, supra nitidis, nervis venisque reticulatis prominulis, subtus pallide glaucis, nervis prominentibus; petiolo compresso, striato, glabro, limbo dimidio brevior: panicula ♀ axillari, umbellata, glaberrima; pedunculo subtenui, compresso, striato, petiolo paulo longiore; umbellis circiter 5, florescentibus pedunculo 4-plo, fructiferis dimidio brevioribus; bracteis majusculis, foliiformibus, palato-petiolutatis vel bracteolis setaceis donatis; floribus minutis, capitato-agglomeratis; sepalis 3, spathulato-ovatis, membranaceis, glabris; petalis 3, brevioribus, cuneato-orbicularibus, crenulatis, fuscioribus, glabris; ovario glabro; drupis majusculis, stipitatis. —In Indiæ peninsula: v. s. in herb. meo et Hook., Neilgherries (Gardner).

A species easily recognized by its rigid and very glabrous habit, and by the presence of leaf-shaped petiolated bracts at the base of, and as long as, the umbels. In habit it somewhat resembles *S. hypoglauca*, but it differs in its larger, more peltate, and more pointed leaves. The leaves are 5 inches long, 4 inches broad, on a petiole 2 inches long, inserted 9 lines within the basal margin. The ♀ peduncle is 2¾ inches long; in the flori-

ferous state the umbels are 4 lines long, with setaceous bracts; but when fructiferous they grow to a length of from  $\frac{3}{4}$  to  $1\frac{1}{4}$  inch, bearing on their summit a small globular head of abortive flowers and from one to three glabrous drupes 5 lines long, 4 lines broad; the putamen is marked with rather distant, raised, radiating striæ.

10. *Stephania intertexta*, nob.;—ramulis teretibus, subcompressis, striatis, glabris; foliis profunde peltatis, suborbiculari-ovatis, imo sinu levissimo aut obsoleto subtruncatis, ultra medium angustioribus, apice rotundiuscule obtuso et emarginato, 10-nerviis, utrinque glaberrimis, supra nervis paulo prominulis, subtus pallidioribus vel rufo-glaucis, nervis venisque paulo prominulis, rubescentibus; petiolo compresso, limbo paulo brevior, glabro, striato, imo torto: panicula ♂ axillari, umbellata, glaberrima, pedunculo petiolo 3-plo brevior; umbellis 5–8, pedunculo 3-plo vel dimidio brevioribus, apice flores plurimos minimos in capitulum aggregatos gerentibus; sepalis 6, cuneato-oblongis, glaberrimis, fusco-membranaceis; petalis obovatis, dimidio brevioribus, aut multo minoribus, fuscis, carnosulis: panicula ♀ axillari, glabra; pedunculo petiolo dimidio brevior; umbellis 5–8, imo bracteolatis, pedunculo 3-plo brevioribus, flores 5–9 sessiles in capitulum agglomeratos apice gerentibus; sepalis 3, cuneato-ovatis, fusco-submembranaceis, glabris; petalis 3, cuneato-orbicularibus, paulo brevioribus, fuscis; ovario glabro; drupis glabris, pericarpio laxo, putamine hippocrepice radiatim et crebre lirato, condylo perforato.—In Ceylonia: *v. s. in herb. Hook.* ♂ et ♀, Ceylon (Mrs. Gen. Walker; Gardner, 32); ♀, Kandy (Thwaites, 2757).

This species appears peculiar to the island of Ceylon, and is recognized by its very glabrous habit, very broad leaves upon long petioles, its short ♂ glabrous panicles, which in the ♀ are much larger. The leaves are  $3\frac{3}{4}$ – $4\frac{1}{2}$  inches long,  $3\frac{3}{4}$ – $4\frac{1}{2}$  inches broad, on a petiole 3–4 inches long, inserted  $\frac{3}{4}$ –1 inch within the basal margin: the peduncle in the ♂ panicle is 9 lines long, its six or seven umbels 3 lines long, with many almost sessile flowers closely aggregated into a globular head, each generally with an oblong bract: the peduncle in the ♀ raceme is  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch long, the umbels 6–9 lines long.

11. *Stephania hernandifolia*, Walp. Rep. i. 96; nob. in Ann. Nat. Hist. 2 ser. vii. 40; Hook. & Th. (in parte) Fl. Ind. i. 196;—*Cissampelos hernandifolia*, Willd. iv. 861; Roxb. Fl. Ind. iii. 482; DC. Syst. i. 533, Prodr. i. 100;—*Cissampelos hexandra*, Roxb. ibid. 841;—*Clypea hernandifolia*, W. & A. Prodr. i. 14; Wight. Icon. tab. 939;—ramulis teneribus, striatis, breviter

pilosis vel demum sæpe glabrescentibus; foliis peltatis, longe ovatis, imo rotundatis vel subtruncatis, a medio sinu utrinque levi sursum gradatim attenuatis, sæpius acuminatis, acumine obtuso vel obtusulo, mucronato, 10–12-nerviis, supra glabris aut in nervis puberulis, subtus cinereo-glaucis, præsertim in nervis pilis articulatis creberrime pubescentibus; petiolo striato, limbo dimidio, 3-plo vel 4-plo brevior, pubescente; panicula ♂ axillari, umbellata, pubescente; pedunculo breviusculo; umbellis circiter 6, pedunculo paulo brevioribus, flores circiter 10 sessiles imo setaceo-bracteolatos in glomerulum aggregatos gerentibus; sepalis 6, spathulato-linearibus vel cuneato-ovatis, puberulis; petalis 3, dimidio brevioribus, cuneato-deltaideis, carnosis, glabris; filamento sepalis longiore; anthera 6-locellata: panicula ♀ simillima, sed longiore; umbellis 5–7, pedunculo dimidio brevioribus, interdum brevissime umbellulatis; floribus capitellatis; ovario drupaque glabris, pericarpio laxo, rubescente.—In India orientali: *v. s. in herb. Soc. Linn.* ♂, Nepal (Wall. Cat. 4977 κ), Segain (Wallich); ♂ et ♀, Goyalpoor (Wall. Cat. 4977 A. a, 4977 B. b): *in herb. Hook.* ♂ et ♀, Assam (Griffiths, 356, 357), Concan (Javin), &c.

This species is widely diffused over the Indian peninsula, and is easily recognized by its more or less acuminate oblong leaves, generally upon petioles of moderate size, and always pubescent beneath: in this latter character, with two exceptions, it is distinguished from all others. The drawing in Wight's 'Icones' gives a very good representation of both sexes, except that the leaves are generally more narrowly acuminate; and it serves to contrast it with many others that have been confounded with it. The only species that might be mistaken for it is *S. Roxburghiana*, in the description of which I have pointed out the chief marks of distinction, to which I may now add that in the latter the sides of the leaves from the base upwards are always externally rounded, while in the present species the sides present a sensibly and often considerably hollow curvature, and are terminated by a narrow acumination, which is somewhat obtuse at the apex. The leaves are 3–4 inches long,  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches broad, on a petiole 1– $1\frac{1}{2}$  inch long, fixed 6–9 lines within the basal margin. The ♂ panicle has a peduncle  $\frac{3}{4}$ –1 inch long, surmounted by about six umbels 3–9 lines long, each terminated by a glomerulated head of flowers: the ♀ panicle has a peduncle about 1 inch long, with umbels about  $\frac{1}{2}$  inch long; the putamen is small, 3 lines long, 2 lines broad, with many radiating ridges terminated by a small obtuse tubercle; the perforation in the condyle is small.

12. *Stephania discolor*, Walp. Rep. i. 96;—*Clypea discolor*, Bl. *Bijd.* 26;—ramulis teretibus, striatis, glabris; foliis profunde peltatis, deltoideo-ovatis, imo truncatis, summum versus angustioribus, apice obtusis et mucronatis, 9–10-nerviis, supra glaberrimis, nervis tenuibus prominulis, subtus valde glaucis, pilis brevissimis et articulatis pruinoso-puberulis, nervis venisque fulvis prominentibus; petiolo sulcato-striato, subglabro, limbo æquilongo vel paululo brevior: paniculis ♂ axillariibus, solitariis, interdum pluribus, paucis, brevioribus e ramulo brevissimo abortivo enatis, umbellatis, pruinoso-puberulis; pedunculo petiolo 2–4-plo brevior; umbellis 5–8, pedunculo 5-plo brevioribus, apice flores numerosos minutos in capitulum globosum dense aggregatos gerentibus: panicula ♀ axillari, quam in ♂ 3–4-plo longior, umbellata, puberula; pedunculo petiolo subæquilongo; umbellis 6–8, pedunculi  $\frac{2}{3}$  longitudine, apice umbellulis 6, flores plurimos crebre aggregatos in capitulum gerentibus.—In Java: *v. s. in herb. plurimis*, ♂ (Zollinger, 462); *in herb. Hook.* ♂ et ♀ (Spanaghoë); *in herb. Mus. Brit.* ♀ (Horsfield, 472).

This is a Javan species, very distinct from the preceding, recognizable by its larger, broader, more deeply peltate leaves, of a very different aspect, upon much longer petioles. As the above specimens agree with Blume's short character, I have referred them to the same species. It must not, however, be confounded with the *Cissampelos discolor* of De Candolle, or the *C. discolor* of Wallich. The leaves in the ♂ plants are  $3\frac{3}{4}$  inches long,  $3\frac{1}{4}$  inches broad, on a petiole  $3-3\frac{1}{4}$  inches long, inserted 9–11 lines within the basal margin; in the ♀ the leaves are  $2\frac{3}{4}-3\frac{1}{2}$  inches long,  $2\frac{1}{4}-2\frac{3}{4}$  inches broad, on a petiole  $1\frac{3}{4}-2$  inches long, inserted 6–7 lines within the margin. The ♂ peduncle is 6–9 lines long, its umbels  $1\frac{1}{2}-4$  lines long, minutely bracteolated at base, bearing a globular head, 1 line in diameter, consisting of numerous very minute flowers; sepals 6, in two series, oblong, entire, softly pubescent outside; petals 3, cuneately orbicular, one-fourth the length of the sepals, fleshy, glabrous; anthers 6-lobed. The ♀ peduncle is  $2-2\frac{1}{4}$  inches long, the umbels 9–12 lines long, the umbellules 3 lines long; sepals 3, obovate, puberulous outside, shorter than the sepals, fleshy, glabrous; ovary glabrous.

13. *Stephania latifolia*, nob.;—ramulis angulato-striatis, fuscis; foliis majusculis, profunde peltatis, deltoideo-orbicularibus, imo obsolete truncatis, apice breviter acuminatis et mucronatis, supra glabris, viridibus, sublucidis, 12-nerviis, nervis pallidulis, tenuibus, prominulis, subtus sordide glaucis, in nervis fuscis venisque transversis pallidis pilis articulatis

puberulis; petiolo subvalido, valde compresso, sulcato-striato, fusco, subpubescente, limbo paulo dimidio vel triplo brevior: panicula ♂ axillari, umbellata, puberula, pedunculo petiolo multo brevior; umbellis circiter 5 aut 6, pedunculo dimidio vel triplo brevioribus; umbellulis 5 vel 6, singulis flores 15 parvulos brevissime pedicellatos in capitulum aggregatos gerentibus; sepalis 6, subæqualibus, spathulato-ovatis, extus molliter puberulis; petalis 3, dimidio brevioribus, cuneato-orbicularibus, carnosis, glaberrimis; anthera 6-locellata.—In Khasya: *v. s. in herb. Hook.* ♂, Mucklow (Hook. & Th.).

This agrees with the two preceding species in the pubescence of its leaves, but differs in their being still larger, more orbicular, upon much longer, thicker, compressed petioles, which are more deeply inserted within their nearly orbicular basal margin. The internodes are  $3\frac{1}{2}$  inches long; the leaves are 5–6 inches long,  $4\frac{1}{4}$ – $4\frac{3}{4}$  inches broad, on a petiole 2– $3\frac{1}{2}$  inches long, inserted 15–20 lines within the basal margin: the peduncle of the ♂ panicle is  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long, the five umbels 4–5 lines long, with six umbellules 1 line long, each bearing a globular head, 1 line in diameter, consisting of fifteen very shortly pedicellated very minute flowers; the sepals are densely pubescent outside.

14. *Stephania Gaudichaudii*, A. Gray, in Bot. Wilkes's Exped. i. 37;—ramulis tenerrimis, striatis, glabris; foliis parvulis, pel-tatis, deltoideo-ovatis, imo truncatis aut levissime sinuatis, ultra medium angustioribus, summum versus subito constrictis, acumine brevi obtuso et mucronato, 10-nerviis, reticulatis, supra fuscis, nitidis, glabris, subtus ferrugineo-vel sordide glaucis, pilis brevissimis articulatis tomentellis, nervis rufescentibus; petiolo tenui, limbo dimidio vel triplo brevior, subpuberulo: panicula ♂ axillari, umbellata, puberula; pedunculo petiolo brevior; umbellis 3, apice flores plurimos discretos in capitulum aggregatos gerentibus; sepalis 6, biserialis, spathulato-oblongis, extus pilosulis; petalis 3, dimidio brevioribus, cuneato-orbiculatis, glabris.—In Australia: *v. s. in herb. De Candolle* ♂, Port Jackson (Gaudichaud, 34).

This is the most slender and smallest species of the genus; its branches are extremely slender and flexuous, with internodes  $1\frac{1}{4}$ – $1\frac{3}{4}$  inch long; the leaves are  $1\frac{1}{2}$ –2 inches long,  $1\frac{3}{8}$ – $1\frac{3}{4}$  inch broad, on a petiole 10–12 lines long, inserted 4–5 lines within the margin of the limb. The axillary peduncle is 6 lines long, the umbels 3 lines long, each with three secondary umbels 1 line long, and floriferous at the apex; many minute flowers, on extremely short or almost obsolete pedicels, are aggregated in a capitular head; the bracts at the base of the primary and se-

condary umbels are linear,  $1\frac{1}{2}$ –2 lines long; those of the flowers are much smaller, as long as the sepals, all being clothed with articulated hairs.

15. *Stephania obvia*, nob.;—ramulis compressis, sulcato-striatis, glaberrimis; foliis profunde peltatis, ovatis, imo rotundato-truncatis, ultra medium constrictis et longe acuminatis, acutis, mucronatis, 10-nerviis, utrinque glaberrimis, supra virentibus, lucidis, subtus pallide viridibus, nervis tenuibus venisque fuscis, paulo prominulis; petiolo limbo subæquilongo, glabro, compresso, striato, imo torto.—In Java: *v. s. in herb. Hook.* (Horsfield, 684).

I have seen no specimen with which this plant harmonizes: *S. longa* and *S. Japonica* are the species to which it comes nearest; but it differs from them in its more sharply acuminate and acute, bright, polished leaves, somewhat paler below, and in its longer, much thicker, and very compressed petiole. The leaves are  $1\frac{1}{2}$ –2 inches apart,  $4\frac{1}{2}$ –5 inches long,  $3\frac{1}{2}$  inches broad, on a petiole  $3\frac{1}{2}$  inches long, inserted 10 or 11 lines within the basal margin. The specimen is without flowers.

16. *Stephania concinna*, nob.;—ramulis teneribus, teretibus, striatis, glabris; foliis profunde peltatis, deltoideo-orbicularibus vel deltoideo-ovalibus, imo subtruncatis, hinc sensim angustioribus, summum versus breviter constrictis, apice obtusulo et mucronato, 10-nerviis, utrinque glaberrimis, supra pallidis, subnitidis, subtus levissimis, cinereo-vel lacteo-glaucis, nervis paulo promiulis et ad basin membrana conjunctis; petiolo subtenui, glabro, limbo dimidio vel triplo brevior, striato, glabro: panicula ♂ axillari, umbellata; pedunculo petiolo dimidio brevior; umbellis 6–9, paululo brevioribus, flores circiter 6 minutos sessiles in capitulum aggregatos gerentibus; sepalis 6, membranaceis, oblongis, extus pilis articulatis puberulis; petalis 3, subrhomboideis, dimidio brevioribus, carnosulis; anthera 6-loba: panicula ♀ umbellata, puberula; pedunculo petiolo subdimidio brevior; umbellis 4–6, pedunculo dimidio brevioribus; umbellulis 6, floribus capitatis; putamine radiatim lirato, in interstitiis favoso-punctato, fulvo-cretaceo; condylo perforato.—In Java: *v. s. in herb. Hook.*, Java (Horsfield).

This is a Javan species, of very peculiar aspect, with leaves quite glabrous, very smooth, above of a very pale green colour, beneath of an opaque, enamel-like, pale glaucous hue, with polished raised nerves. It somewhat approaches in its aspect that form of *S. Roxburghii* represented by the *Cissampelos hexandra*, Roxb. (non Ham.) and *C. Pata*, Buch.; but it differs from them in



many characters, especially in its glabrous habit. The leaves in the ♂ plant are  $2\frac{1}{2}$  inches long,  $2\frac{1}{4}$  inches broad, on a petiole  $1-1\frac{1}{8}$  inch long, inserted 5-6 lines within the basal margin: in the ♀ plant they are  $2\frac{1}{4}-4$  inches long,  $2\frac{1}{4}-3\frac{3}{4}$  inches broad, on a petiole 2 inches long, inserted 10 lines within the margin. The ♂ peduncle is 6 lines long, its umbels 4 lines: the ♀ peduncle is  $\frac{3}{4}-1$  inch long, its umbels 4-5 lines, the umbellules in fruit  $2\frac{3}{4}$  lines long.

17. *Stephania hypoglauca*, nob.;—*Cissampelos discolor*, Wall. *in parte*;—ramulis tenuibus, glabris; foliis minus peltatis, deltoideo-orbiculatis, imo sinuato-truncatis, deinde angustioribus, apice rotundato-obtusis et valde emarginatis, coriaceis, marginibus revolutis, sub-10-nerviis, utrinque glaberrimis, supra pallidis, subtus pallidioribus, nervis prominulis; petiolo tenui, striato, glabro, limbo dimidio brevior: panicula ♀ axillari, umbellata, folio duplo longiore, glaberrima; pedunculo tenui, elongato, petiolo 3-plo longiore, suberecto; umbellis 3, divaricatum radiatis, subinæqualibus, pedunculo dimidio vel tertia brevioribus, apice capitato plurifloris; floribus sessilibus, in receptaculo arcte agglutinatis; sepalis et petalis (utrisque 3) ovarioque glabris.—In India orientali: *v. s. in herb. Soc. Linn.* ♀, Nielgherries, Noton (Wall. Cat. 4982 A. a, non A. b).

This specimen was considered by Dr. Wallich identical with the ♀ plant of *Cyclea versicolor* (his *Cissampelos discolor*), which is fastened on the same sheet, but which is a very different plant: it resembles it somewhat in the form and texture of its coriaceous leaves, but has a widely different kind of inflorescence, and flowers of another structure. In the rigidity of its leaves it approximates somewhat to another Nielgherry species, *S. appendiculata*; but the difference between them is very wide. It is a climbing plant, of very glabrous habit, having very slender branches with axils  $\frac{3}{4}-1$  inch apart; the leaves are  $1\frac{1}{2}-2$  inches long,  $1\frac{3}{4}$  inch broad, on a very slender petiole  $1-1\frac{1}{8}$  inch long, inserted  $2\frac{1}{2}-3$  lines within the margin of the basal sinus. The very slender ♀ peduncle is  $2\frac{1}{8}$  inches long, its umbels  $\frac{1}{2}-1$  inch long, obsolete umbellulate at their apex, with numerous glabrous flowers and half-grown drupes.

18. *Stephania elegans*, Hook. & Th. Fl. Ind. i. 195;—ramulis tenuibus, striatis, glabris, triangulari- et lanceolato-oblongis, imo truncatis aut subcordatis, dehinc sensim acutis, apice mucronulatis, margine reflexo sublimbatis, 10-nerviis, utrinque glaberrimis, reticulatis, supra nitidis, viridibus, subtus pallidioribus, nervis rufescentibus prominulis; petiolo subtenui, nitido, striato, limbo brevior vel rarius æquilongus:

panicula ♂ axillari; pedunculo petiolo subæquilongò, filiformi, bis trichotome ramoso, ramis ultimis alternatim pedicellatis; floribus hinc corymbulosis, glaberrimis; sepalis 6, ovatis; petalis 3, dimidio brevioribus, orbicularibus: panicula ♀ axillari, simillima; pedunculo filiformi, petiolo 3-plo longiore, ramis ultimis alternatim pedicellatis; floribus hinc corymbulosis, bracteolis minimis donatis; sepalis 3, ovatis, glabris; petalis 3, minoribus, cuneato-orbiculatis; drupa glabra, pericarpio laxo, rigidulo; putamine stramineo-cretaceo, utriusque radiatim lirato, liris tuberculatis, interstitiis punctulatis.—In India orientali: *v. s. in herb. Mus. Brit. et Linn.* ♀, Nepal (Wallich): *in herb. Hook.* Khasya et Sikhim (Hook. & Th.); ♂, Darjeeling et Khasya (Griffiths, 581); ♂, Assam (Jenkins); ♂ et ♀, Gurwhal (Falconer, 89); ♀, Mucklow (Hook. & Th.).

This species is readily distinguished by its rather small, long, triangular, acuminate leaves, truncated or subcordate at base, bearing some resemblance to those of *Cissampelos sympodialis*, to which plant its ♂ inflorescence offers also much similarity in its form. The leaves are  $2\frac{1}{4}$ –3 inches long,  $1\frac{1}{4}$ – $1\frac{3}{4}$  inch broad, with a basal sinus often 2 lines deep, the petiole (9–15 lines long) being inserted 4–5 lines within the margin of the sinus.

19. *Stephania exigua*, nob.;—ramulis tenerrimis, teretibus, striatis, glabris; foliis profunde peltatis, deltoideo-oblongis, imò rotundatis aut vix sinuatis, a medio gradatim angustioribus, acumine obtusulo et mucronato, 10-nerviis, utrinque glaberrimis, membranaceis, supra obscure viridibus et subnitidis, subtus pallidioribus, sublucidis, nervis tenuissimis vix prominulis; petiolo filiformi, tenuissimo, striolato, imò torto, limbi fere longitudine: panicula ♂ axillari, glaberrima, umbellata et umbellulata; pedunculo capillari, petiolo paulo breviorè; umbellis 5–6, capillaribus, pedunculo dimidio brevioribus; umbellulis 4–6, apice flores plurimos minutos sessiles capitulato-aggregatos gerentibus; sepalis 6, obovatis, extus puberulis, fusco-membranaceis; petalis 3, dimidio brevioribus, cuneato-rotundatis.—In insulis Philippinis: *v. s. in herb. Mus. Brit. et Hook.* (Cuming, 1533).

A very pretty, slender species, somewhat approaching the preceding in its delicate habit and in the size and shape of its leaves; but they are not almost triangular at base; its inflorescence, also, is very different. Its branches are scarcely  $\frac{1}{2}$  line in thickness, with their axils  $\frac{1}{2}$ –1 inch apart; the leaves are  $1\frac{3}{4}$ – $2\frac{1}{4}$  inches long,  $1\frac{1}{4}$ – $1\frac{3}{4}$  inch broad, on a delicate petiole  $1\frac{1}{4}$ – $1\frac{3}{4}$  inch long, inserted 5 lines within the margin: the capillary ♂ peduncle is  $1\frac{1}{4}$  inch long, its umbellate rays 5–7

lines long, the secondary rays 1 line long, each bearing a globular head 1 line in diameter, consisting of three minute flowers closely agglutinated by the confluence of their pedicels.

20. *Stephania Australis*, nob. in Ann. Nat. Hist. ser. 2. vii. 40; A. Gray in Bot. Wilkes's Exp. p. 38;—*S. hernandifolia*, Hook. & Th. (in parte) Fl. Ind. i. 196;—*S. Hookeri*, F. Mueller, MS.;—*Cissampelos Australis*, A. Cunningham, MS.;—ramulis teneribus, teretibus, striatis, demum subglabris; foliis profunde peltatis, deltoideo-oblongis, imo sinu levissimo truncatis, a medio sensim angustatis, subacuminatis, acumine obtusulo emarginato et mucronulato, marginibus integris, subrevolutis, firmiter submembranaceis, 12-nerviis, supra glabris, subnitidis, nervis tenuibus reticulatis, subtus pallide glaucis, puberulis, nervis prominulis; petiolo tenui, striato, puberulo vel glabrisculo, imo tumidulo et torto, in ♂ limbo paulo, in ♀ dimidio brevior: panicula ♂ axillari, umbellata, puberula; pedunculo tenui, petiolo paulo brevior; umbellis circiter 6, dimidio vel triplo brevioribus; umbellulis 6, flores plurimos minutos globoso-aggregatos gerentibus: panicula ♀ umbellata, subglabra, pedunculo petiolo brevior; umbellis 4–6, triplo brevioribus; umbellulis circiter 3, istis triplo brevioribus, drupas 3–4 glabras parvulas brevissime pedicellatas gerentibus.—In Australia: v. s. in herb. Heward ♀, Sydney (A. Cunningham); in herb. Hook. ♂, Hastings River (Burke); ♀, Burnett River (Mueller), Brisbane River (Mueller).

This plant, first collected by Allan Cunningham in 1819, bears much resemblance to *S. hernandifolia*, especially in the pubescence of its foliage, and has been considered identical with it by the authors of the 'Flora Indica'; it differs, however, in its larger, broader, and less acuminate, more polished leaves upon longer petioles; and, besides the difference in its inflorescence, the putamen is smaller, with other markings. The leaves are  $3\frac{1}{2}$ –5 inches long,  $3\frac{1}{4}$  inches broad, on a petiole 2– $3\frac{3}{4}$  inches long, inserted 9–15 lines within the basal margin. The peduncle in the ♂ plants is 11 lines long, the umbels 7 lines, the umbellules 2 lines long: in the ♀ the peduncle is 11–13 lines long, the umbels 4–6 lines, the umbellules 2 lines long; the putamen is 2 lines long, nearly orbicular, with somewhat distant radiating tubercular ridges.

21. *Stephania? pallidula*, nob.;—ramulis tenerrimis, teretibus, valde striatis, pallide glaucis; foliis profunde peltatis, suborbicularibus, imo subtruncatis, longe ultra medium paulo angustioribus, apice rotundiusculis emarginatis obsolete mucronatis, 10–12-nerviis, utrinque glaberrimis, supra pallide

glaucis, subtus pallidissimis; petiolo elongato, tenuissimo, pallido, limbo fere duplo longiore.—In Australia: *v. s. in herb. Hook.*, Fitzroy and Stokes range (F. Mueller).

A specimen without flowers, with quite the habit of a *Stephania*, growing on rocky declivities above the cataracts in the Fitzroy and Stokes range. The slender virgate branches have internodes  $1\frac{1}{2}$ –2 inches long; the leaves are 2– $2\frac{3}{4}$  inches long,  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches broad, on a very slender petiole 3–4 inches long, inserted 8–9 lines within the basal margin. It has no resemblance to any other species of the genus.

22. *Stephania praelata*, nob.;—ramulis subangulatis, striatis, compressis, sordide tomentellis; foliis profunde peltatis, deltoideo-ovatis, imo suborbicularibus et leviter sinuatis, gradatim angustioribus, apice subacutis, submucronulatis, submembranaceis, 9-nerviis, supra subnitentibus, glabris, nervis stramineis, reticulatis, subtus pallidioribus, glaucis, cinereo tomentosis, nervis paulo prominulis; petiolo subtenui, imo crassiore, limbo æquilongo aut longiore, tomentello: panicula ♂ supra-axillari, iterum umbellata, tomentella; pedunculo petiolo brevioris, tenuissimo; umbellis circiter 5, bracteolis 1 vel 2 parvulis acutissimis munitis; umbellulis 6–7, obsolete bracteolatis, brevissimis; floribus minutis, subcorymbosis; sepalis cuneato-ovatis, glabris; petalis dimidio brevioribus, latioribus, imo cuneatis, apice sinuato-3-lobulatis; anthera 6-locellata: panicula ♀ simillima.—In Africa australi: *v. s. in herb. Lindl.* ♂ et ♀ (Cooper, 904).

A species near *S. hernandifolia*, differing in its broader, not acuminate leaves upon longer petioles, in their being tomentose, not pubescent, and a different modification of the inflorescence. The axils are  $1\frac{1}{2}$ – $2\frac{1}{2}$  inches apart; the leaves in the ♂ are more orbicular,  $2\frac{1}{4}$  inches long,  $2\frac{1}{4}$  inches broad, scarcely sinuate at base, the petiole being 2 inches long, inserted 6 lines within the basal margin: in the ♀ they are 3 inches long,  $2\frac{3}{4}$  inches broad, on a petiole 2– $2\frac{3}{8}$  inches long, inserted 7 lines within the margin. The ♂ peduncle is slender,  $1\frac{1}{2}$  inch long; the primary umbels are capillary, 6 lines long, with one or two basal acuminate or setaceous bracts 2 lines long; the secondary umbels and pedicels 1–2 lines long: the ♀ peduncle is stouter,  $1\frac{3}{4}$  inch long; the umbels 3 lines long, quite bractless; the three or four umbellules or pedicels 2 lines in flower, 5 lines in fruit, all pubescent; the immature drupes are glabrous.

23. *Stephania lævigata*, nob.;—alte scandens, ramulis teretibus, striatis, glabris; foliis majusculis, peltatis, suborbiculari-

ovatis, imo truncatis vel truncato-bisinuatis, ultra medium sensim angustioribus, apicem versus subito breviter constrictis, acute acuminatis et mucronatis, 12-nerviis, utrinque glaberrimis, supra nitidis, viridibus, reticulatis, subtus virenti-glaucis, opacis, nervis tenuibus, subprominulis; petiolo tenuissimo, elongato, compresso, striolato, pallido, glabro, imo fusco et torto, limbo fere æquilongo: panicula ♂ axillari, glabra; pedunculo petiolo 3-4-plo brevior, tenuissimo, compresso; umbellis 9, pedunculo 4-plo brevioribus; umbellulis 3, floribus alternatim pedicellatis et corymbulosis: panicula ♀ axillari; pedunculo compresso, petiolo dimidio brevior; umbellis 3, umbellulisque fructiferis crassioribus.—In insula Fernando Po: *v. s. in herb. Hook.*, Clarence Peak, alt. 3500 ped. (Mann, 629).

A species distinguished by its rather large, deeply peltate, orbicular leaves, shortly and sharply acuminate at their apex, upon very long slender petioles, and by other characters. The branches are very slender; the leaves in the ♂ plant are  $5\frac{1}{4}$  inches long,  $4\frac{1}{2}$ -5 inches broad, on a very slender compressed petiole,  $4-4\frac{3}{4}$  inches long, inserted  $1-1\frac{1}{4}$  inch within the basal margin. The capillary ♂ peduncle is 2 inches long, its umbels  $\frac{1}{2}$  inch long, its corymbulose umbellules 2 lines long. The leaves in the ♀ plant are  $2\frac{3}{4}$ - $3\frac{1}{2}$  inches long,  $2\frac{1}{4}$ -3 inches broad, on a petiole  $3\frac{1}{2}$  inches long, inserted 6-9 lines within the basal margin; the peduncle is 1 inch long, its umbels 4 lines; the putamen is 3 lines long,  $2\frac{1}{2}$  lines broad, with a perforated condyle.

24. *Stephania fastosa*, nob.;—ramulis teretibus, compressis, ad nodos subdilatatis, cortice laxo; foliis peltatis, deltoideo-oblongis, imo sinu levi subtruncatis vel in junioribus rotundioribus, ultra medium sensim angustatis, apicem versus gradatim aut sæpius repentine acuminatis, acumine obtusulo vel acuto, 10-12-nerviis, subcoriaceis, utrinque glabris, supra subnitidis, viridibus, valde reticulatis, subtus fere concoloribus, opacis, nervis prominulis, venis subimmersis et e reticulatione creberrima, hinc bullato-rugulosis, marginibus recurvulis; petiolo tenui, striato, fusco, glabro, subangulato, superne canaliculato, limbo 3-4-plo brevior: paniculis ♂ umbellatis, axillaribus, solitariis aut geminis, glaberrimis; pedunculo tenui, petiolo multo longiore, compresso, striato; umbellis 6-9, pedunculo 4-5-plo brevioribus; umbellulis 6-9; floribus plurimis, pedicellatis, capitato-corymbulosis, bracteolis parvis, margine ciliolatis; sepalis 6, cuneato-oblongis, interioribus paulo majoribus; petalis 3, dimidio brevioribus, orbiculari-rhomboides, fuscocarnosis; anthera peltata, distincte 6-locellari, locellis margine

hiantibus.—In Africa tropicali: *v. s. in herb. Hook.*, Camaron Mountains, alt. 7000 ped. (Mann, 1242 & 2169).

This is a third African species marked by very distinct characters. The leaves are  $2\frac{1}{2}$ –4 inches long,  $2$ – $2\frac{3}{4}$  inches broad, on a petiole  $1$ – $1\frac{1}{2}$  inch long, inserted 6 lines within the basal margin. The ♂ peduncle is  $2$ – $2\frac{1}{4}$  inches long, with umbels 4–7 lines long.

25. *Stephania ramuliflora*, nob.;—ramulis griseis, cinerascentibus, glabris, spiraliter striatis; foliis profunde peltatis, deltoideo-rotundis, imo suborbiculatis vel obsolete truncatis, apice sensim acutis, 11-nerviis, supra fusco-viridibus, lucidis, sub lente obsolete pilosulis, subtus brunneo-glaucis, glabris, nervis teneris, fuscis, nitidis, prominulis; petiolo tenui, striato, glabro, limbo æquilongo vel longiore: racemo ♂ petiolo paulo brevior, rigidule puberulo, e basi alternatim ramoso, ramis brevibus, approximatis, bracteolatis, breviter umbellatis; umbellis 3, iterum brevissime umbellatis; umbellulis alternatim divis; floribus pedicellatis, hinc globoso-corymbulosis; sepalis 6, quorum 3 exterioribus oblongo-acutis, pilis brevibus articulatis roride puberulis, 3 interioribus subovatis, fuscis, margine submembranaceis et pilis paucis articulatis subfimbriatis; petalis 3, consimilibus et paulo minoribus; anthera 6-locellata.—In Borneo: *v. s. in herb. Hook.* ♂, Bangar-massing (Motley, 1108).

A species much resembling *S. levigata* in the size and shape of its leaves, and in the length and insertion of the petiole; but it differs from every other species in its racemose inflorescence, in which respect it is quite peculiar. There is some approximation to this mode of inflorescence in *S. glandulifera*; but there the panicle is on a very long naked peduncle, umbellate at the apex, or with the umbels sometimes obsoletely alternate. The axils are about 2 inches apart; the leaves are 4 inches long,  $3\frac{3}{4}$  inches broad, on a petiole  $3\frac{1}{2}$ –4 inches long, which is inserted 1 inch within the basal margin; they are much more shining above than in *S. rotunda*, and under the lens show a few scattered, short, articulated hairs. The raceme is  $2\frac{1}{2}$ –3 inches long, with a somewhat flexuous rachis, having numerous short alternate branches about 2 lines apart, beginning from the very base; most of the branches have fallen off in the specimen, but their cicatrices and bracts remain; the upper persistent branches are 3 or 4 lines long, and ramified as stated above: the whole raceme is covered with a pruinose kind of pubescence, consisting of extremely short articulated hairs. The anomalous character of its inflorescence, which in this respect differs from any other

species of the genus, may be regarded as a stunted branchlet in which the abortive leaves are reduced to the condition of minute bracts, each of its axils being furnished with a very short umbellated panicle.

### 30. CLAMBUS.

This genus was founded by me, more than twelve years ago, upon a Mexican plant, collected by Ruiz and Pavon, its general characters being sketched, two years since, in my synopsis (*suprà*, p. 17). It belongs to the *Cissampelideæ*, and differs from *Cissampelos* in its very different habit, its inflorescence, and the presence of six sepals and six scale-like petals in the male flower: in this latter respect it approaches *Pericampylus* and *Pselium*; but its anthers are combined in a peltate disk supported on a slender filament, as in *Cissampelos*. It offers some analogy towards *Stephania*; it has the same number of sepals, but double the number of petals, a different kind of inflorescence, and a dissimilar habit. The female plant is unknown. The genus differs from all others of the *Cissampelideæ* in its leaves not being peltate, and therefore not palmatinerved, the nerves being all imparipinnate as we find them in *Pycnarhena*, *Penianthus*, and some species of *Hypserpa*: the leaves are supported upon very short petioles, and are ovate or elliptic, with about eight pairs of alternately diverging nerves; they are very reticulated above, glabrous on both sides, but opakely white beneath: this cretaceous appearance, when viewed under a lens, is found to consist of a prominent network of white and extremely minute crossing fibres, like a spider's web, which fills the areoles of the ordinary venous reticulations. The inflorescence is axillary, upon an elongated, very slender rachis longer than the leaf; its alternate branches, bracteolated at base, are dichotomously divided, the branches bearing many alternate pedicels, bracteolated at base, and spicately arranged.

CLAMBUS, nob. ;—*Flores* dioici. *Masc. Sepala* 6, biseriata, sub-æqualia, alternatim paululo angustiora, oblonga, petaloidea, nervo longitudinali signata, patentia, æstivatione imbricata. *Petala* 6, subbiseriata, æqualia, sepalis dimidio breviora, lineari-oblonga, apice emarginata, crasso-carnosa. *Stamen* unicum, centrale; *filamentum* tenue, sepalis paulo brevius; *anthera* peltata, 3-locularis, annuliformis, circa *connectivum* peltiforme affixa, loculis emarginatis, transversim bilocellatis, extus horizontaliter 2-valvatim dehiscentibus.—*Fl. fœm.* et *fructus* ignoti.

Frutex *Mexicanus*, *forsan volubilis, glaberrimus*; *folia alterna*,  
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*palata, late ovata vel elliptica, nitida, subtus incana, pinnato-nervosa, breviter petiolata: panicula ♂ axillaris, glaberrima, gracilis, folio longior, bracteolata, mox ramosa, ramis longiusculis, ramulis spicatum plurifloris; flores minuti, brevissime pedicellati.*

*Clambus araneosus*, nob.;—ramulis virgatis, subangulatis, glabris, cortice rugoso; foliis palatis, ovalibus vel elliptico-oblongis, apice canaliculatum recurvis et repente brevissime acuminatis, penninerviis, nervis utrinque 8, alternatim parallele curvatis, et inter se anastomosantibus, transversim venosis, subcoriaceis, utrinque glabris, supra opace et læte viridibus, subtus nervis venisque reticulatis subprominentibus, areolis elegantissime et minutissime arachnoideis, hinc cretaceo-lutescentibus; petiolo superne canaliculato, glabro, limbo 18-plo brevior: panicula ♂ axillari, folio æquilongus vel longiore, glaberrima, floribunda, alternatim ramosa; rachi tenui, ramis filiformibus, subflexuosis, ramulis brevibus, imbricatim bracteolatis; floribus minutis, e bracteolis brevissime pedicellatis, glaberrimis.—In Mexico: *v. s. in herb. De Boissier* (Pavon).

This is a specimen with an aspect very different from any Menispermaceous plant I have hitherto seen. The internodes, at intervals of about an inch, have a prominent decurrent rib on each side; the leaves are of a dull pale green colour, somewhat stout in texture, singularly nerved, 4–4½ inches long, 2½–3 inches broad, on a petiole only ¼ inch long, palately inserted. The ♂ axillary panicle is 3–5 inches long; the rachis is slender and compressed, its primary filiform branches 1½–2 inches long, the branchlets 2–3 lines long, the pedicels as long as the bractlets, ¼ line long. At the termination of the main branches, the leaves being abortive, a number of alternate ascending panicles sprout at intervals of about half an inch, the whole thus assuming a terminal thyrsoïd inflorescence.

### 31. CYCLEA.

This genus, established by Dr. Arnott, was confounded with *Clypea* and *Stephania*, until I first pointed out the lines of demarcation between them. It is easily distinguished from them by its habit, another kind of inflorescence, by having a gamosepalous calyx, a turbinately campanular corolla, both of them often toothed or cut into deeply lacinated segments, and by having a very different putamen. The authors of the 'Flora Indica,' in acknowledging the validity of *Cyclea*, rightly united my genus *Rhaptomeris* with it: in the former the calyx and co-



rolla are tubular, with a four- or five-toothed border; in the latter the segments are deeper; so that the difference is only one of degree, and is consequently of specific rather than of generic value. A casual observer may be misled in regard to the number of floral parts in the female flower; for in examining a capitate head of flowers, a number of persistent scales, varying from four to twelve, may be seen sometimes surrounding an ovary; but these extra scales really belong to other abortive flowers congregated on the same receptacle. The learned botanists, in their work above mentioned (p. 200), describe the female flower of *Cyclea* as having two sepals laterally placed about a solitary ovary, without any petal; but this does not correspond with my observations: in the very numerous flowers I have examined I have never yet found a sepal unaccompanied by a petal, which is of nearly equal size, seated upon its claw, the former being always recognizable by its external pubescence, while the latter is invariably more fleshy and perfectly glabrous. This fact is reduced to a certainty in *C. peltata*, where the inflorescence is more spread, each flower being supported by a pedicel of equal length, bracteated at its base; we there find constantly a single sepal, with its corresponding petal, both placed on that side of the ovary which regards the axis of inflorescence. In *C. Arnottii* and in *C. versicolor*, where the ultimate ramifications of the racemes are extremely abbreviated, and on which two or more sessile flowers are closely aggregated, they are sometimes constituted as in the case last mentioned, but very often we see as many as three or four sepals with their corresponding petals around a single persistent ovary, where the other corresponding ovaries have disappeared: in such case there can be no doubt that this increased number of floral parts is due entirely to the decadence or abortion of the ovaries, which often fall out of a head of flowers while under examination. We may therefore consider that normally each female flower of *Cyclea* consists of one sepal, one petal, and one ovary, as in *Cissampelos*, with this difference, that in the former the sepal and petal are antical, while in the latter they are postical. The putamen of *Cyclea* is smaller than that of *Stephania*, and more globular; its condyle is not disciform, but is expanded into a large hollow chamber, convex exteriorly on both sides, around which the somewhat hippocrepical cell is circumscribed; the embryo is like that of *Cissampelos*, with its cotyledons somewhat shorter.

CYCLEA, Arnott.—*Flores* dioici. *Masc.* *Calyx* gamosepalus, tubulosus; *tubus* aut late campanulatus ore 4-5-dentatus, vel turbinatus et profundius in lacinias totidem oblongas fissus, æstivatione valvata. *Corolla* campanulata, calyce dimidio

brevior, in lacinias 4-5 plus minusve profundas fissa, laciniis integris, truncatis aut crenulatis, glabra. *Stamen* unicum; *filamentum* centrale, tenue, teres, petalo æquilongum; *anthera* peltata vel peltatim globosa, 4-6-locellata, loculis circa connectivum sæpe minusculum adnatis, extus rima horizontali hiantibus et singulis septo horizontaliter 2-locellatis.—*Fœm.* *Sepalum* unicum, oblongum, squamiforme, extus pilosum. *Petalum* unicum, dimidio brevius, orbiculare, carnosum, glabrum, ad unguem sepali affixum. *Ovarium* solitarium, gibboso-globosum, villosum, 1-loculare, 1-ovulatum. *Stylus* brevis, subexcentricus. *Stigmata* 3, subulata, acutissima, suberecta. *Drupa* ovata, carnosa, sæpius hirsuta, stigmatate persistente basi proximo notata; *putamen* subosseum, globoso-ovale, paululo compressum, 1-loculare, loculo circa condylum hipocrepice gyrato; *condylus* excentralis, subglobosus, utrinque convexus, vacuus, in sinu basali pro vasorum introitu pertusus. *Semen* loculo conforme; *embryo* intra *albumen* simplex, hipocrepicus, tenuiter teres, *cotyledonibus* semiteretibus, incumbentibus, *radicula* supera ad stylum spectante 3-plo longioribus.

Frutices *scandentes Asia intertropica, sæpius pubescentes aut retrorsum hispidi*; folia *alterna, peltata, deltoideo-oblonga aut obovata, subcordata, 5-7-nervia, petiolo tenui*: inflorescentia ♂ *axillaris, aut racemus elongatus, rachi tenui, sæpe geniculatim flexuosa, floribus numerosis minutis in glomerulos remotos aggregatis aut*; in utroque sexu *panicula racemosa, ramis alternis, remotis, longiusculis, sæpe iterum ramosis, floribus corymbulosis aut agglomeratis.*

1. *Cyclea peltata*, Hook. & Th. (in parte) Fl. Ind. i. 201;—*Menispermum peltatum*, Lam. Dict. iv. 96; Willd. Sp. iv. 827;—*Cocculus peltatus*, DC. Syst. i. 516, Prodr. i. 96;—*Cissampelos barbata*, Wall. Cat. in parte;—*Pada Valli, Rheede, Hort. Mal.* vii. 93, tab. 49;—ramulis striatis, pilis longis rigidis retrorsum hirsutis; foliis peltatis, obovatis, basi truncatis vel leviter sinuatis, ultra medium sensim angustioribus, apice obtusis vel subacutis, et breviter mucronatis, 10-nerviis, reticulatis, supra in nervis venisque longe pilosis, marginibus crenulatis, hirsuto-ciliatis, subtus pallidioribus et longe villosopilosis; petiolo striato, canaliculato, limbo 3-4-plo brevior, patentim hirsuto: panicula ♂ axillari, longissima, alternatim ramosa; ramis remotis, divaricatis, inferioribus longiusculis, gradatim minoribus, superioribus brevissimis aut obsolete; floribus subsessilibus, minutis, interrupte spicatis et in glomerulos creberrime congestis, calyce fere ad basin in segmenta 4-5 laciniato, extus piloso; petalo turbinato, glabro,

dimidio brevior, profunde 4-5 fisso; anthera 4-5-loba, exserta: panicula ♀ racemosa, folio multo brevior, botryoidea, composita divisa; ramis brevibus, subcorymbosis; floribus minimis, in ramulis ultimis sessilibus, creberrime congestis; sepalo oblongo, glabro; petalo orbiculari, 4-plo brevior; ovario piloso, drupis pilosis.—In India orientali et Java: *v. s. in herb. Soc. Linn.*, Sylhet (♂, Wall. Cat. 4978 c. a; ♀, 4978 c. b): *in herb. Hook.* ♂ et ♀, Java (Spanaghoë, 194); ♂, Assam (Griffiths, 355).

Rheede's figure, as far as regards the leaf and drupiferous raceme, is very characteristic of the species: the inflorescence, however, affords a peculiar feature by which it may be recognized, as both calyx and corolla are more deeply cleft than in any other species. The authors of the 'Flora Indica' unite with this several other species, which I have here shown to differ in many essential points. The leaves are  $4\frac{1}{2}$ -7 inches long,  $3\frac{1}{4}$ -5 inches broad, with a broad and shallow basal sinus 2 lines deep, the petiole,  $1\frac{3}{4}$  inch long, being inserted 6-10 lines within the margin. The slender rachis of the ♂ is 5 or 6 inches long, or sometimes longer, its divaricated inferior branches are  $1\frac{1}{2}$  inch long at the base, and gradually diminish upwards till they merge into the terminal branch, each being furnished at its base with a small bract; the flowers are aggregated on these branches in capitate heads, the latter sometimes stipitated, more often sessile, about 2 lines in diameter, and 3-6 lines apart. The ♀ raceme is about 4 inches long, and much resembles a bunch of very small grapes, the drupes being crowded together, each about 3 lines in diameter.

2. *Cyclea barbata*, nob.;—*Cyclea peltata* (*in parte*), *Hook. & Th. Fl. Ind.* i. 201;—*Cissampelos barbata*, *Wall. (in parte)*;—ramulis striatis, pilis longissimis divaricatis lanuginosis; foliis profunde peltatis, deltoideo-ovatis, imo subsinuato-truncatis, ultra medium angustioribus, apice subobtusis vel acutis, 10-nerviis, supra viridibus, in nervis tenuibus tantum sparsissime et longe pilosis, alioquin glabris, marginibus pilis longis flavidis crebriter ciliatis, subtus cinereo-glaucis, et præsertim ad nervos pilis longis flavidis patentim hirsutis, junioribus utrinque dense sericeo pilosis, crinibusque longis flavidis valde lanuginosis; petiolo tenuissimo, striato, pilis longis paucis retrorsis munito, limbo dimidio vel 3-plo brevior.—In Ava et Pegu: *v. s. in herb. Soc. Linn.*, Rangoon (Wall. Cat. 4978 A. a, non b); in via ad Taong Dong (Wall. Cat. 4978 E).

A very marked species, readily distinguishable from the preceding by the much thinner texture of its leaves, their more

orbicular form, their very dense sericeous clothing, and their very slender and much shorter petioles. None of the specimens are in flower. The leaves are  $2\frac{1}{2}$ –5 inches long,  $2\frac{1}{4}$ – $4\frac{1}{2}$  inches broad, with a scarcely appreciable basal sinus, on a petiole  $1\frac{3}{4}$ –2 inches long, inserted 6–14 lines within the basal margin.

3. *Cyclea Arnottii*, nob.;—*Cyclea Burmanni*, *Wight (in parte) Ill.* i. 22;—idem, *Hook. & Th. (in parte) Fl. Ind.* i. 201;—*Clypea Burmanni*, *W. & A. Prodr.* i. 14;—ramulis striatis, patentim pilosis; foliis peltatis, deltoideo-oblongis, imo leviter sinuato-truncatis, a medio gradatim longissime attenuatis, apice aristato-mucronatis, 10–12-nerviis, valde reticulatis, supra glaberrimis aut tantummodo in nervis obsolete pilosis, in nervo marginali reflexo sparse ciliatis, subtus pallidioribus, molliter pubescentibus, præsertim in nervis venisque prominulis; petiolo angulato-striato, imo torto et crassiore, pilosulo, limbo 3–4-plo brevior: racemo ♂ axillari, interrupte spicato, folio subæquilongo, cinereo pubescente; rachi tenuissima, in axillulas minute bracteolatas remotiusculas geniculatim flexuosa, hic ramosa, ramis inferioribus brevibus, superioribus fere obsolete, apice agglomerato-multifloris, capitulis globosis; floribus minutis, sessilibus, creberrime congestis; calyce campanulato, extus piloso, margine 4–5-dentato, dentibus brevibus, subacutis; corolla campanulata, dimidio brevior, glabra, ore 4–5-denticulato; anthera vix exserta, 4–5-locellata: racemo ♀ axillari, pubescente, rachi crassiore, subflexuosa, ramis brevissimis, propioribus, capitellatis, hinc interrupte spicato; floribus subsessilibus, creberrime congestis; sepalo obovato, reflexo, extus piloso; petalo dimidio brevior, suborbiculato, glabro; ovario piloso; stylo longiusculo; stigmatibus longis, setaceis, divaricatis.—In India, penins. Malayana et Pegu: *v. s. in herb. Soc. Linn.* ♂, Kelaben (Wall. Cat. 4978 A. b, non a); ♀, Prome et Rangoon (Wall. Cat. 4978 B); *sine flore*, Singapore (Wall. Cat. 4978): *in herb. De Cand.* ♂, Tavoy (Wallich, 1292, non Cat.); ♂, penins. Ind.: *in herb. Hook.*, Rangoon (McClelland); ♂, Mangalore (Ward); ♀, E. Ind. (Walker); ♀, Kurg, Madras (Hook. & Th.).

This species has been confounded with *C. peltata*; but it is distinguished from it by its far more acuminate leaves, by the peculiar character of its inflorescence, more especially by its more entire and simply dentate tubular calyx and corolla, and, finally, by its different geographical range. The leaves are  $4$ – $5\frac{1}{2}$  inches long,  $2\frac{1}{4}$ –4 inches broad, on a petiole 7 lines to  $1\frac{1}{2}$  inch long, rarely longer, inserted 6–9 lines within the margin of the sinus, which is seldom more than 1 line deep. The ♂ raceme is 4–7 inches long, upon a very slender rachis geniculated at the

axils, which are  $\frac{3}{4}$  inch apart, two or three of the lower axils emitting a short branchlet 3 lines long; others become shorter as they ascend, till at last they become obsolete, so that the capitate heads of flowers are sessile in the upper and stipitated in the lower axils, the globose heads of sessile minute flowers being 2–3 lines in diameter. The ♀ raceme is about 3 inches long, with short branchlets 2–3 lines long, and 3–5 lines apart, the capitate heads being 1–2 lines in diameter.

4. *Cyclea Burmanni*, Hook. & Th. Fl. Ind. i. 201;—Rhaptomeris Burmanni, nob. in *Ann. Nat. Hist.* ser. 2. vii. 41;—Clypea Burmanni, W. & A. (*in parte*) *Prodr.* i. 14;—Cocculus Burmanni, DC. *Syst.* i. 517, *Prodr.* i. 96;—Smilax, sp., *Burm. Zeyl.* 218, tab. 101:—ramulis teneribus, teretibus, striatis, retrorsum longe hirsutis, vetustioribus glabris; foliis peltatis, elongato-deltaeideis, imo sinuato-truncatis aut vix cordatis, infra medium panduræformiter sinuatis, angulis rotundatis, sursum subsinuatis, gradatim et curvatim angustioribus, sæpe valde acuminatis et aristato-mucronatis, coriaceis, reticulatis, 10–12-nerviis, nervo marginali glabrescente, rarius ciliato, supra nitidissimis, glabris vel parce pilosis, subtus fulvo vel cinereo pubescentibus et in nervis divaricatim pilosis; petiolo tenui, striato, piloso, limbo dimidio brevior: panicula ♂ axillari, folio multo longiore, laxe ramosa, puberula, ramis remotis, elongatis, filiformibus, divaricatis, remotiuscule et breviter ramulosis, ramulis corymbifloris, floribus pedicellatis; calyce late campanulato, ore brevissime 4–5–6-dentato, extus piloso, intus sparse puberulo; corolla depresso-cyathiformi, margine integro involuto, glabra, carnosula; anthera 4–5–6-locellata: racemo ♀ axillari, petiolo subæquilongo, pubescente, rachi flexuosa, breviter ramosa; floribus numerosissimis, in ramis sessilibus et creberrime conglomeratis; sepalo suborbiculari, extus piloso; petalo orbiculari, paulo minore, glabro et carnosulo; drupis pilosis.—In Indiæ peninsula et Ceylon: *v. s. in herb. Mus. Brit.* (hb. Hermannii, vol. ii. fol. 27 et 72), Ceylon: *in herb. Heward* ♂, Ceylon: *in herb. meo* ♀, Ceylon (Gardner, 33); *in herb. DeCand.*, penins. Ind. ♀ (Wight, 40): *in herb. Hook.*, Ceylon, ♂ (Walker, 194); Kandy, ♂ (Champion); Concan, ♂ (Stocks, Gibson).

This species, which is almost peculiar to Ceylon, is very distinct from *C. Arnottii*, with which it has been confounded: it differs from it in its smaller, much narrower, polished, coriaceous leaves, which are usually contracted towards the base in a panduriform manner, and its calyx is more globose. The leaves are  $3\frac{1}{2}$ –6 inches long,  $1\frac{1}{2}$ –3 inches broad, on a petiole 1– $2\frac{1}{4}$  inches long, inserted 5–8 lines within the margin of the basal sinus,

which is 1-3 lines deep. The ♂ panicle is 10-12 inches long, with spreading branches 4 inches long, having a short acute bractlet at base.

5. *Cyclea versicolor*, nob.;—*Cyclea peltata*, Hook. & Th. (*in parte*) *Fl. Ind.* i. 201;—*Cissampelos discolor*, Wall. *Cat. in parte*, (*non DC.*);—ramulis teretibus, striolatis, glabris; foliis peltatis, latissime ovatis, imo truncato-cordatis, apice subito acutis et mucronulatis, marginibus revolutis, undulato-crenatis, 10-nerviis, reticulatis, coriaceis, glaberrimis, supra pallidis, subtus pallide glaucis et pubescentibus; petiolo striato, piloso, limbo 2-3-plo brevior, validiusculo: racemo ♂ axillari, petiolo 4-plo longiore, sericeo pubescente; rachi tenui, remotiuscule interruptim spicata; floribus in axillulis bracteolatis, 4-5, fasciculatis, breviter pedicellatis; calyce subglobozo, ore contracto et breviter 4-5-dentato, extus piloso; corolla late campanulata, paululo brevior, ore fere integro et paulo involuto, glabra, carnosula; anthera 8-locellata, ore inclusa: panicula ♀ axillari, racemiformi, ramosa, pubescente, folio subæquilonga, ramis alternis, iterum iterumque ramulosis, ramulis tertiariis apice flores circiter 6 sessiles aggregatos gerentibus; sepalo parvo, ovato, extus piloso; petalo orbiculari, glaberrimo, carnosulo, sæpe paulo majore et ad unguem sepali affixum; ovario gibboso-globozo, petali longitudine, pilosulo; stylo brevissimo; stigmatibus 4, setaceis, subdivaricatis.—In India orientali: *v. s. in herb. Soc. Linn.* ♂, Neilgherries (Wall. *Cat.* 4982 B, ex herb. Heyne); ♀, Trivandrum (Malabar), ex herb. Wight (Wall. *Cat.* 4982 A. b, non A. a).

I have not adopted Wallich's specific name, lest it should be mistaken for the *Clypea discolor* of Blume or *Cissampelos discolor* of De Candolle. The plants above quoted differ from the two preceding species in their more glabrous habit, their shorter and more slender petiole, in the form of the ♂ inflorescence, and in their 8-celled anthers. The leaves are 3-4 $\frac{3}{4}$  inches long, with a very shallow, broad basal sinus, 2-2 $\frac{3}{4}$  inches broad, on a petiole  $\frac{3}{4}$ -1 inch long, which is inserted 7 or 8 lines within the margin of the basal sinus. The rachis of the ♂ inflorescence is slender, 4 $\frac{1}{2}$  inches long, with bracteolated axils  $\frac{1}{2}$  inch apart, from each of which issue three fasciculated 1-flowered pedicels scarcely longer than the linear bracteole, which is 1 $\frac{1}{2}$  line long. The ♀ panicle is about 4 inches long and very pubescent; its lower branch is 1 $\frac{1}{2}$  inch long; the others,  $\frac{1}{2}$  inch apart, diminish upwards to 4 or 5 lines; the secondary branchlets, which are 4 lines long and 6 lines apart, have tertiary branches like pedicels, 1 line long and 1 $\frac{1}{2}$  line apart, bracteolated at base, and sup-

porting at their apex a globular head consisting of a few sessile, closely aggregated flowers, which are very minute.

6. *Cyclea laxiflora*, nob.;—ramulis tortim striatis, retrorsum longe pilosis; foliis peltatis, deltoideo-ovatis, imo rotundiusculis, sinuato-truncatis et subcordatis, summum versus sensim angustioribus, apice acutis et longe cuspidato-mucronatis, 12-nerviis, supra pallide viridibus, glabris aut obsolete pilosis, subtus lurido-glaucis, piloso-pubescentibus, nervis venisque prominulis, in nervo marginali ciliatis; petiolo longiusculo, subtenui, retrorsum piloso, limbo brevior: panicula ♂ supra-axillari, pubescente, petiolo 4–5-plo longiore, pendula, laxe et divaricatim ramosa; racbi debili, striata, pubescente, ramis subremotis, inferioribus longiusculis, sursum gradatim decrescentibus, iterum breviter ramulosis, ramulis laxe corymbulosis, plurifloris; pedicellis longiusculis, alternatim dispositis, pilosulis; calyce turbinato, glabro, ore 4-dentato; petalo in squamas 4 minutissimas lineares glabras diviso; anthera vix exserta, 4-locellata: panicula ♀ elongata, pendula, longissime ramosa, ramis iterum breviter ramulosis, ramulis alternatim plurifloris, floribus pedicellatis.—In Malacca: *v. s. in herb. Hook.* ♂ et ♀, Malacca (Griffiths).

In this species the leaves, though shaped as in *C. peltata*, are smaller and less peltate: it is also distinguished from it by its longer ♂ panicle, which is more lax, the flowers spreading corymbosely, each upon a long pedicel, and not agglomerated into interrupted capitate heads; its flowers are remarkable for the dwarfed condition of their corolla, which is cleft to the base into four minute linear scales; the ♀ inflorescence is also very different. Its leaves are  $3\frac{3}{4}$ – $4\frac{1}{4}$  inches long,  $3$ – $3\frac{1}{4}$  inches broad, on a petiole  $1\frac{3}{4}$  inch long, inserted 5 lines within the margin of the basal sinus, which is 1 line deep. The ♂ panicle is 8 or 9 inches long; its branches, spreading at nearly a right angle, are about  $\frac{3}{4}$  inch apart; the inferior one is 3 inches long, the others becoming gradually shorter; they are bare at their lower half, and then give out branchlets 3–5 lines long, which are corymbosely provided with lax pedicellated flowers. The somewhat distant, slender pedicels are bracteolated at their base, pilose,  $1\frac{1}{2}$  line long; the calyx, 1 line long, cuneately turbinate, quite glabrous, dark, submembranaceous, divided halfway down into four equal segments; the petals one-sixth of the length of the calyx; the filament as long as the latter. The ♀ panicle is about 10 inches long; its branches are less spreading, about  $\frac{3}{4}$  inch apart, and mostly 3 or 4 inches long, becoming gradually smaller; they ramify again into short branchlets, which are 3–4 lines apart

and 3–5 lines long, and have alternate, very short, few-flowered branchlets forming small corymbs.

7. *Cyclea peregrina*, nob.;—ramulis sulcato-striatis, retrorsum hispidulis, demum glabris; foliis profunde peltatis, deltoideo-ovatis, imo sinuatis vel leviter cordatis, ultra medium gradatim angustioribus, apice acutis et cuspidato-mucronatis, 12-nerviis, supra fusco-viridibus, nitentibus, fere glabris, reticulatis, subtus fusco-glaucis, puberulis, nervis venisque prominulis, marginibus nervo munitis et subrevolutis, glabris; petiolo retrorsum hispido, medio glabriore, limbo 4–5-plo brevior: panicula ♂ in ramis annotinis aphyllis solitaria, folio longiore, racemiformi, ramosa, griseo pubescente, ramis inferioribus longiusculis, superioribus gradatim decrescentibus, iterum ramulosis, ramulis brevibus; pedicellis brevissimis, alternatim subapproximatis; floribus hinc densiuscule corymbulosis; calyce turbinato, vix ad medium 4-dentato, extus piloso, crassiusculo, nigrescente; corolla glabra, calyce 4-plo brevior, ad basin 4-fissa, laciniis cuneato-oblongis, apice truncatis, marginibus subinvolutis; filamento calyce dimidio brevior et corolla duplo longior; anthera inclusa, 4-loba: panicula ♀ axillari, racemiformi, iterum iterumque alternatim ramosa; floribus brevissimis, pedicellatis; drupis subpilosis.—In Borneo: *v. s. in herb. Hook.* ♂ et ♀, Bangarmassing (Motley, 673–684).

A species near *C. laxiflora*, but differing in its more glabrous stems, in its leaves with much shorter and stouter petioles, in a less elongated ♂ inflorescence, with branches more densely corymbose; the calyx not half the length and breadth of that in the former species, upon closer and shorter pedicels, and with shorter stamens. The axils are  $2\frac{1}{2}$  inches apart; the leaves are  $3\frac{1}{4}$ – $3\frac{1}{2}$  inches long,  $3\frac{1}{4}$ – $3\frac{1}{2}$  inches wide, with a broad basal sinus 2–3 lines deep, on a petiole 1 inch long, inserted 7 lines within the margin of the sinus. The ♂ inflorescence is  $5\frac{1}{2}$  inches long, with its lower branch  $1\frac{1}{2}$  inch long; the branchlets 2–3 lines long, alternately and approximately divided, all very pubescent; pedicels not longer than the campanulately turbinate calyx, which is subpilose outside,  $\frac{1}{3}$  line long, with a 4-toothed border; petals squamiform, erect, one-sixth the length of the calyx, filament half the length of the calyx.

8. *Cyclea debiliflora*, nob.;—ramulis sulcato-striatis, sparse pilosis aut fere glabris; foliis profundiuscule peltatis, deltoideo-oblongis, imo truncatis aut sinu levi vix cordatis, ultra medium sensim acuminatis, acumine cuspidato, e basi 12-nerviis, subcoriaceis, utrinque glabris, junioribus pilosis, supra lucidis, nervis tenuibus, prominulis, subtus fusco-glaucis,



reticulato-venosis, marginibus nervo donatis et subrevolutis, glabris (in junioribus longe ciliatis); petiolo limbo 3-4-plo brevior, glabro aut sparsim piloso: panicula ♂ axillari, folio 2-plo longiore, sæpius longe et tenuiter ramosa, ramis basalibus longiusculis, gradatim brevioribus, iterum iterumque ramulosis, vel a ramis caducis aut abortivis filiformi et apice florifera; rachi debili, fere glabra, ramulis subbrevibus, alternatim divisis, puberulis; floribus distinctis, pedicellatis; calyce tubuloso, usque ad medium 4-dentato, submembranaceo, glaberrimo; corolla campanulata, dimidio brevior, 4-dentata; anthera 4-locellata, exserta.—In Khasya: *v. s. in herb. Hook.* ♂, Khasya, altitud. 4000 ped. (Hook. & Th.).

A species somewhat like *C. Arnottii*, from which it differs in its narrower leaves, its lax branching male inflorescence, and its glabrous flowers. The leaves are  $3\frac{1}{2}$ –5 inches long,  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches broad, on a petiole  $1-1\frac{1}{8}$  inch long, inserted 6 lines within the margin of the basal sinus, which is only 1–3 lines deep. The ♂ raceme-like panicle in one specimen is  $5\frac{1}{2}$  inches long, with bracteolated axils about  $\frac{1}{2}$  inch apart, the lower branches being almost filiform and 4 inches long, diminishing upwards, the secondary branchlets 4–6 lines long, bearing towards their summit several alternate pedicellated flowers in lax corymbulose heads. In the other specimen the rachis is straight and almost filiform, 11 inches long, with bracteolated axils 3–6 lines apart, from which the lower branches have disappeared, the intermediate and more terminal short branches alone remaining floriferous.

9. *Cyclea pendulina*, nob. ;—ramulis teretibus, spiraliter flexuosis, pilis ferrugineis patentibus puberulis; foliis paululo peltatis, deltoideo-oblongis, imo subtruncatis, sinu levi subcordatis, sursum gradatim angustioribus, apice obtusulis et mucronatis, 9–11-nerviis, supra fusco-viridibus, lucidis, glaberrimis, reticulatis, subtus paulo pallidioribus, nervis venisque prominulis, ferrugineo pilosis; petiolo tereti, imo crassiore, pubescente, limbo 3-plo brevior: paniculis ♂ axillaribus, solitariis vel geminis, elongatis, pendulis, racemiformibus, puberulis, folio longioribus; rachi gracili, divaricata, alternatim et remotiuscule ramosa, ramis subbrevibus, iterum iterumque alternatim ramulosis, ramulis flores plurimos pedicellatos ferentibus; floribus in capitulum laxum subcorymbulosum approximatis; calyce tubuloso, ore 4-dentato, extus piloso; corolla subcampanulata, 4-plo brevior, ore 4-crenato, glabro; filamentis longiusculo; anthera 4-locellata, ultra calycem exserta: panicula ♀ axillari, pubescente, folio duplo longiore, pendula, racemosa, ramis longiusculis, pensilibus, gradatim brevioribus, ramulis alter-

natim paucifloris, bracteolatis; sepalo parvo, bracteiformi, pilosulo; petalo majore, euneato-orbiculari, apice subretuso, carnoso, glabro; ovario piloso.—In insulis Malaccanis: *v. s. in herb. Mus. Brit.* ♂ et ♀, ins. Nicobar (Soc. Frat.).

A species near *C. debiliflora*, differing in its less polished, scarcely peltate leaves, with an obtuse summit, on a longer petiole, and in the structure of its pilose flowers. The leaves are  $4\frac{1}{4}$  inches long, 3 inches broad, on a petiole  $1\frac{1}{2}$  inch long, inserted 2 lines within the margin of the basal sinus, which is 1 line deep. The ♂ panicle is 7–8 inches long; its lower branches are 3–6 lines apart and 2 inches long, gradually decreasing upwards; the secondary branchlets are 2–3 lines long, bearing at their summit a globular head of lax pedicellated flowers. The flowers are small, not more than 1 line long, on a pedicel of equal length; the calyx is tubular, straight, and cleft at its summit for a third of its length into four equal teeth; the corolla, cup-shaped and glabrous, is a quarter the length of the calyx, with a margin of four short teeth; the filament is exerted considerably beyond the mouth of the calyx, and supports a 4-lobed peltate anther. In the ♀ flower the ovary is gibbously oblong, with an excentric erect style, half its length, terminated by three divaricated subulate stigmata.

10. *Cyclea deltoidea*, nob., in Kew Journ. Bot. iii. 258;—ramulis gracilibus, demum glabris; foliis subpeltatis, deltoideo-rotundatis, imo subrotundatis vel obsolete truncatis, apice obtusis, rarius acutiuseulis et mucronulatis, 7–10-nerviis, nervis tenuibus utrinque prominulis, utraque facie glaberrimis, supra viridibus, subtus sordide glaucis; petiolo tenui, striato, glabro, limbo dimidio brevior: racemo ♀ axillari, folio longiore, subspicato, undique glabro, brevissime et alternatim ramoso; floribus minimis, paucis, in ramis aggregatis; drupis glabris.—In Hong-Kong: *v. s. in herb. Hook.* ♀ (Champion).

The authors of the 'Flora Indica' (p. 202) allude to the specimens of some panicles in fruit, which they found in the Khasya Hills and brought home in spirits, and they state that they resemble very closely the panicles of Major Champion's plant: accordingly a specimen is attached to the plant from Hong Kong above quoted, which I have examined and find it has no relation to it, and that it does not belong to the same genus, or even to the same tribe; on the contrary, it must be referred to some unknown genus of the tribe *Pachygoneæ*, as the putamen differs from all others at present recorded in being spiniferous.

The above species differs from all the preceding in the small size of its leaves, which are only subpeltate; and it is singular

in having no indication of pubescence in any part of the plant except on the small bracts of the raceme. The leaves are about  $1\frac{3}{4}$  inch long,  $1\frac{1}{2}$  inch broad, on a petiole  $\frac{3}{4}$  inch long, inserted 1-3 lines within the margin of the scarcely appreciable basal sinus. The raceme is somewhat flexuose, about  $1\frac{1}{2}$ - $2\frac{1}{2}$  inches long, with alternate axils 2 lines apart; out of each axil there is a linear bract 1 line long, two one-flowered pedicels of equal length, and a branchlet somewhat longer, bearing three other almost sessile flowers; the putamen and seed quite conform to the characters of the genus.

### 32. PERAPHORA.

This genus was first proposed by me for a plant originally collected in Bhootan by Griffiths, which had female flowers and fruit only. Since then I found that the *Cyclea populifolia* described by Messrs. Hooker and Thomson is the male plant of the same species. It differs from *Cyclea* in its habit, its large, coriaceous, cordate leaves on a rigid petiole almost palately inserted, its different mode of inflorescence, in its floral structure, and in its putamen. Although the male flower has a campanular calyx, it has no petal; the female flower has two comparatively large, opposite, sacciform, fleshy sepals, and no petal, and its putamen bears no resemblance to that of *Cyclea*. It is thus certain that, with the exception of a campanular calyx in the ♂ flower, the floral structure in both sexes is totally at variance with the characters of the genus to which it has been referred by the authors of the 'Flora Indica.' In the number of calycine parts it accords with *Antizoma*; but it differs in having no petals, and in the gamosepalous calyx of its ♂ flower: these differences, together with the very dissimilar habits of the plants, will maintain the validity of both these genera. The putamen, in its shape and its curved spines, resembles that of some species of *Stephania*, but it differs in having an imperforated condyle.

The generic name was suggested by the singularly bursiform sepals of the female flower.

PERAPHORA, nob.;—*Cyclea* (*in parte*), *Hook. & Th.*;—*Flores* dioici. *Masc. Calyx* globoso-campanulatus, ore parvo, 4-5-dentato, glaber, carnosulus. *Petalum* nullum. *Stamen* unicum, centrale, subinclusum; *filamentum* breviter filiforme; *anthera* subglobosa, 4-5-locularis, loculis circa connectivum peltatum in anulum connatis, margine rima externa horizontaliter dehiscentibus.—*Fœm. Sepala* 2, opposita, pro mole majuscula, suborbiculata, valde concava, imo gibboso-saccata, ungue brevi affixa, carnosula, lateribus tenuioribus et expansis,

apice truncato et subreflexo. *Petala* nulla. *Stamina* nulla. *Ovarium* solitarium, gibboso-orbiculare, 1-loculare, loculo lunato; *ovulum* unicum, loculo conforme, funiculo brevi a medio faciei ventralis appensum. *Stylus* brevis. *Stigma* breviter 3-fidum, laciniis linearibus, sulcatis, reflexis. *Drupa* subglobosa, stigmate persistente ad hilum proximo notata, carnosae; *putamen* tenuiter osseum, late subovatum, compressum, peripheriam versus utrinque spinis obtusis recurvo-hamatis in seriebus 3 circa condylum hipocrepicis concentricè dispositis echinatum, 1-loculare, loculo lunato; *condylus* disciformis, excentralis, utrinque concavus, imperforatus, medio stria longitudinali sulcatus; *semen* loculo conforme; *embryo* ignotus.

Frutex in regionibus Himalayæ scandens; folia majuscula, vix peltata, oblonga, imo cordata, a medio sensim angustiora, apice acuta, a basi 7-nervia, coriacea, subtus pubescentia, petiolo tereti, limbo brevior: inflorescentia ♂ et ♀ racemi-formi-paniculata, pubescens, ramis alternis, divaricatis, iterum divisus, bracteolatis; flores minimi, pedicellati, glabri.

*Peraphora robusta*, nob.;—*Cyclea populifolia*, Hook. & Th. *Fl. Ind.* i. 202;—*Menispermea*, Griffiths in *Itin. Boot.* ii. 114 & 165; *Icon. Boot.* tab. 22 & 23;—ramis crassiusculis, tortim striato-sulcatis, cortice glauco et rimoso; ramulis flexuosis, striatis, pubescentibus; foliis vix peltatis, deltoideo-oblongis, imo profunde cordatis, lobis basalibus rotundatis, sursum gradatim angustioribus, apice acutis et mucronulatis, a basi 7-9-nerviis, nervis tenuibus, extus ramosis, coriaceis, supra nitidis, lævissimis, pallidis, subtus lurido-glaucis, sparsim rigide puberulis, nervis venisque transversis valde prominentibus; petiolo pubescente, subtenui, apice incrassato, imo longe tumidulo, tortuose flexo, limbo dimidio brevior: paniculis ♂ subbrevibus, e nodis annuotinis aphyllis plurimis, fasciculatis, pubescentibus; ramis alternis, brevibus, divaricatis, iterum divisus, ramulis corymbifloris, floribus minimis; pedicellis brevissimis, glabris; calyce subgloboso, glabro: racemis ♀ ramosis, ex axillis solitariis, vel e nodis (foliis delapsis) binis, elongatis, puberulis; ramis alternatim divaricatis, ramulisque brevibus, imo bracteolatis, ramulis ultimis floribus 2-3 breviter pedicellatis et fasciculatis munitis, pedicellisque sericeo pilosis; sepalis et ovariiis glabris.—In Himalaya orientali: v. s. in *herb. Mus. Brit. et Leman.* ♀, Bhootan (Griffiths, 1732): in *herb. Hook.* ♂, Sikhim (Hook. & Th.); ♂ et ♀, Bhootan (Griffiths, 1731 et 1732).

Griffiths, in his 'Itinerary,' has given a very good description of both sexes of this plant, without referring it to any particular genus. He found the ♂ specimens in the forests of Pancee, on the

Deo river, in Dewangiri, at the foot of the Bhootan Mountains; and the ♀ on Mount Panukka, at an elevation of nearly 6000 ft. In habit it has no resemblance to any species of *Cyclea*, to which the ♀ plant was referred by the authors of the 'Flora Indica,' and bears an aspect very different from that of any species of the *Cissampelideae*, to which section it evidently belongs. The wood of its scandent branches, which are  $\frac{1}{2}$  inch in diameter, is very hard and exhibits the peculiar structure of the order; the branchlets are twining,  $\frac{1}{8}$  inch thick, with axils  $\frac{3}{4}$ – $1\frac{1}{4}$  inch apart; the leaves are 5–7 inches long,  $3\frac{1}{2}$ – $5\frac{3}{4}$  inches broad, with a basal sinus terminating in a more or less acute angle,  $\frac{3}{4}$ –1 inch deep; the petiole is extremely thickened and tortuous at its base, 2– $2\frac{1}{2}$  inches long, and inserted  $\frac{1}{2}$ –1 line within the margin of the contracted sinus. Several ♂ panicles are fasciculated in the aphyllous nodes of the older branches; they are about  $1\frac{1}{4}$  inch long, the alternate branches  $\frac{1}{2}$  inch long, whose approximated branchlets, each bearing five or six flowers, altogether form a corymbulose head; the calyx is glabrous and  $\frac{1}{4}$  line in diameter. The ♀ racemose panicles grow out of the denuded nodes of the older branches, or out of the leaf-bearing axils in the younger branches; when single, they are 7 inches long, when geminate or fasciculated upon anctinous bare wood, they are 3–5 inches long, with spreading ramifications 3 lines apart and 9 lines long; the bracts are subulately linear, 1 line long, and very pilose; the pedicels are 1 line long, quite glabrous, tumid at the apex; the sepals are 1 line long and broad, fleshy, glabrous, formed like a deep pouch with its upper margin somewhat truncated and reflexed, persistent when the ovary is abortive, but caducous after it is fertilized; the ovary is shorter than the sepals, and seated between their claws; the drupe is fleshy, smaller than a pea, with the persistent style near the point of attachment; the putamen is  $1\frac{3}{4}$  inch long, nearly orbicular, compressed, with many hamately truncated, short, erect, obtuse spines in three concentric series on each face, surrounding the laminiform imperforated condyle. This form of putamen is different from that of *Cissampelos* or *Pericampylus*, and still more unlike that of *Cyclea*.

The flowers in the cartouch fixed on the sheet of one of the above specimens belong to *Cyclea laxiflora*.

### 33. PERICHASMA.

I propose this genus for a plant, belonging to the tropical African flora, which offers many peculiar characters. Although the number of its floral parts corresponds with that of *Stephania*,

the entire aspect of the plant proclaims that it cannot belong to that genus, as does that of *Clambus* for a similar reason. Its slender branches, with very distant axils, are furnished with long, patent, simple hairs, which I have never seen in any species of *Stephania*; its leaves are larger, and, though peltate, are pilose on both sides, and their margins are furnished with a strong marginal nerve, which is indented into several rounded lobes or large crenatures, and they are supported upon unusually long and slender petioles. The inflorescence, instead of being, as in *Stephania*, a compound umbel rarely exceeding an inch or two in length, is here a very slender pendent raceme a foot and a half long, with numerous distant, short, alternate branches, which are again and again alternately divided: in all these respects the general habit of the plant is more in harmony with some species of *Cyclea*. The flowers are very minute, pedicellated, with six oblong, subacute sepals in two series, imbricated in æstivation, three small, ovate, erect petals, and a central stamen almost concealed by the petals. It is, however, in the structure of the stamen that this genus differs essentially from *Stephania*: in the latter genus the anther has three or six cells, connate so as to form a ring, affixed on the margin of a peltate disciform connective, which is supported on the central filament; these cells always burst bivalvately by a crenated horizontal line of sutures. In *Perichasma* the anther has no connective, is comparatively large, completely globular, simply 1-celled, and dehisces by a somewhat small apical opercular valve, which is supported by a columella-like extension of the filament (or *placentoid* of M. Chatin), round which the grains of pollen are secreted; the wall of the globular cell consists of a finely reticulated membrane (apparently deficient of the usual inner lining or endothecium), is very delicate in texture, without the slightest vestige of any dissepiment or nervure, its three indented furrows being due to the external pressure of the petals which embrace it in the bud. This organization of the anther is without any parallel in the *Menispermaceæ*, and reminds us of the opercular theca of some of the mosses.

The generic name is derived from *περὶ*, *circumcirca*, *χάσμα*, *hiatus*, in allusion to the feature just mentioned. I have placed it among the *Cissampelideæ*, but I am not certain that this is its proper place.

*PERICHASMA*, nob.—*Flores* dioici. *Masc. Sepala* 6, biserialia, quorum 3 interiora paululo longiora, oblonga, submembranacea, demum expansa. *Petala* 3, dimidio breviora, orbicularia, carnosula, margine membranaceo, erecta, sepalis exterioribus opposita. *Stamen* unicum, centrale; *filamentum* tenue, petalis

brevius; *anthera* majuscula, globosa, leviter 3-sulcata, apicifixa (septorum nullo vestigio), omnino 1-locularis, theca tenuiter membranacea et minutissime reticulata, supra medium rima horizontali operculatim dehiscente, operculo parvo, apicali, columella centrali suffulto; *pollen* simplex.—*Fœm.* ignoti.

*Frutex scandens Africa tropica*; rami *longe pilosi*; folia *alterna, peltata, oblonga, imo truncata, palmati-nervia, margine grosse crenato, sparse pilosa, longe et tenuiter petiolata*: inflorescentia ♂ *supra-axillaris, longissime racemiformis, pendula, rachi tenuissima, puberula, alternatim ramosa, ramis iterum iterumque ramosis, ramulis plurifloris*; floribus *minutis, alternis, pedicellatis, glabris*.

*Perichasma latifcata*, nob.;—ramulis teretibus, patentim longe molliter pilosis; foliis peltatis, suboblongis, imo rotundatis, aut sinu levi subtruncatis, ultra medium sensim angustatis, apice obtusis et aristato-mucronatis, nervo valido marginali grosse crenatis, 12-nerviis, supra sublucidis, viridibus, reticulatis, sparse pilosis, subtus sordide glaucis, præsertim in nervis prominentibus densius pilosis; petiolo tenuissimo, compresso, striolato, sparse retrorsum piloso, limbo fere æquilongus: racemo ♂ *supra-axillari, valde elongato*; pedunculo tenuissimo, compresso, spiraliter torto, subpuberulo, a basi alternatim ramoso, ramis subbrevis, divaricatis, iterum iterumque alternatim ramulosis, ramulis plurifloris pedicellisque alternis pilosis; floribus minutis, glabris; sepalis oblongis, interioribus paulo majoribus, anthera petalis erectis subinclusa.—In Africa tropicali: *v. s. in herb. Hook.* ♂, Fernando Po (Mann, 236).

This plant has an aspect quite unlike any Menispermaceous species that I have seen, its habit more resembling that of an *Anamirta* or a *Cyclea*. The branch is 2 lines in diameter, with internodes  $5\frac{1}{2}$  inches long; the leaves are  $5-5\frac{1}{2}$  inches long,  $4-4\frac{3}{4}$  inches broad, on a petiole 4–5 inches long, inserted 9–12 lines within the basal margin; the marginal crenatures are rounded, each about  $\frac{1}{2}-\frac{3}{4}$  inch in length. The pendent rachis,  $\frac{1}{3}$  line thick, is about 20 inches long; its branches,  $\frac{1}{2}-\frac{3}{4}$  inch apart, are  $\frac{1}{2}$ –1 inch long; their branchlets, 2 lines apart and 1–2 lines long, bear about eight or ten alternate pedicels  $\frac{1}{2}-\frac{3}{4}$  line long; the flower-bud is  $\frac{1}{3}$  line in diameter.

### 34. COCCULUS.

Much confusion has existed in regard to this genus. The earliest mention of the name was made by Bauhin and Plukenet, who used it to denote the *Cocculus officinarum* of commerce.

The plant supposed to yield this famous drug was first botanically named *Menispermum Cocculus* by Linnæus; but *Cocculus* as a genus was not established till 1818, when De Candolle first employed the name to comprehend a very heterogeneous series of plants, most of which had previously been included in *Menispermum*. The *Menispermum Cocculus*, Linn., ought therefore to have been the type of De Candolle's genus; but such was the want of knowledge and the uncertainty then prevailing in regard to the subject, that no one really knew to what plant the true *Cocculus* of commerce belonged. It had been referred by botanists to three several species:—(1) *Cocculus lacunosus*, DC., which I considered identical with his *Cocculus suberosus*; (2) *Cocculus Plukenetii*, DC. (now a *Pachygone*), a species identified by De Candolle with the *Menispermum Cocculus*, Willd. (non Linn.); and (3) *Cocculus suberosus*, DC. (now an *Anamirta*). It is to the last that the drug in question really belongs; it is identical with the *Menispermum Cocculus*, Linn., but not of Willdenow. When I published my notes on *Menispermaceæ* in 1851, I was conscious that, according to strict rule, the *Cocculus suberosus* ought to have been taken as the type of the genus *Cocculus*; but in that case *Anamirta*, established by Colebrook in 1819, must have been suppressed, and a new genus formed from the plants I had retained in *Cocculus*. In the midst of the confusion that had so long prevailed, I considered it far better not to disturb *Anamirta*, but to choose another of the oldest species remaining in De Candolle's genus for the type of *Cocculus* as now restricted: accordingly *Cocculus Carolinus*, DC. was selected for this purpose. Having cleared away from De Candolle's heterogeneous group the numerous species possessing a structure at variance with this type, *Cocculus* was thus for the first time reduced to precise limits in its floral as well as in its carpological organization.

It was endeavoured, however, by botanists of the highest reputation, to set aside this precision with regard to *Cocculus*. The authors of the 'Flora Indica,' led away by their too ardent desire for abrogating genera and species, disregarded the limits I had assigned to this genus, and refused to acknowledge *Nephroica*, *Holopeira*, and *Diploclisia*, on the plea that a difference in the form of the petals (though constant and very peculiar in each group) is of little importance in a generic point of view: heedless, too, of the carpological features which distinguish these genera, they fused together, after their peculiar method, all the genera of my *Platygoneæ*, reducing them to a few species of *Cocculus*, corresponding in number with my genera. It is much to be regretted that the authors of the new 'Genera Plantarum' should have adopted these extreme views in that



useful work, and have been thus led to form many erroneous conclusions concerning *Menispermaceæ*. It is scarcely possible that this hasty disavowal of valid genera and species can meet with general assent or can be maintained when the different points of structure are carefully compared. If the method of ignoring marked differential features in the floral as well as in the carpological structure be adopted in one tribe, as attempted here, it ought equally to be applied to the other tribes of the family: in such case its many genera, deprived of their precise limits, would collapse, and the whole distribution would again become involved in endless confusion. In order to avoid this, and to preserve one uniform consistency, it appears to me desirable to maintain *Cocculus* as a distinct genus of the *Platygoneæ*, within the limits I have ascribed to it; otherwise the genus *Cocculus* must disappear, as the *Nephroica* of Loureiro would take its place by right of a priority of many years—or perhaps *Epibaterium* of Forster, which is of still older date.

In regard to the plea before mentioned, that the form of the corolla, even where it assumes uniformly a very peculiar shape, is a character too trivial to be entertained, I might cite hundreds of instances where that feature forms a leading mark of generic distinction; indeed it has been employed successfully in several families by the above-mentioned botanists; and there can be no especial reason for discarding it in the *Menispermaceæ*, particularly in the instances of *Nephroica* and *Holopeira* as distinguished from *Cocculus*. The carpological structure of *Diplochisia* is unquestionably distinct from that of the last-mentioned genus; its putamen and condyle are constructed upon quite a different plan, and its cotyledons and radicle offer very different proportions; while the mode of its inflorescence and the general aspect of the plants afford the most striking marks of distinction.

The difference in the form of the corolla is so manifest in all these four genera, that, in examining the male plants, it is impossible to mistake one genus for another; but this is not the case as regards *Pachygone*, which has a floral structure hardly different from *Cocculus*: the form of the petals and the trimerous arrangement of parts are alike in both genera, the only difference being that in the former the outer series of bracteiform sepals is generally wanting. It is chiefly in the female plant, and the structure of the putamen and seed, that the two genera become utterly irreconcilable.

The fruit of *Cocculus* is well distinguished: the putamen is osseous, reniformly globular, slightly compressed, with a peculiar grooved surface, and has a large excentric condyle, round which the lunate or nearly cyclical cell extends; the con-

dyle is vertically divided by a complete septum, parallel to the two faces, into two hollow chambers, each having an external crescent-shaped aperture; the seed is cyclical, flattened on its inner side, and consists of simple albumen enclosing a nearly annular embryo, with a narrow terete radicle half the length of two fleshy subfoliaceous incumbent cotyledons, which are twice its breadth.

In Prof. Martius's 'Flora Brasiliانا,' Dr. Eichler enumerates two species, neither of which belongs to the genus. The first is *Cocculus filipendula*, Mart., of which a drawing is given (*l. c.* fasc. xxxviii. tab. 42. fig. 4); this shows clearly that I was quite correct in considering it to be a species of *Odontocarya* (*Contr. Bot.* iii. 65). The second is *Cocculus enneandrus*, Eichl., established upon a Peruvian plant from the collection of Ruiz and Pavon, of which the ♂ flower only is figured (*l. c.* tab. 42. fig. 5); this is considered by Dr. Eichler to be a variety of *Cocculus Carolinus* that has strayed into Peru, and which, under another soil and climate, has produced monstrous flowers. There appears no reason for this improbable supposition, as that species has never been seen beyond the limits of the United States. If it be a monstrous flower, it is far more likely to be an abnormal condition of some plant which we know to be growing in Peru or its vicinity. The inference appears to me certain, that the plant cannot belong to *Cocculus*, from which it differs in having an inner whorl of three stamens which stand alone, without petals, in addition to the ordinary number of six perfect stamens embraced by as many petals; the anthers as they are described are very different from those of *Cocculus*, as are also the petals, whose involuted lobes are lateral, not basal as in that genus. Dr. Eichler gives no drawing of the plant; but, from its description, it appears very likely to belong to the South-American genus *Odontocarya*; indeed, in the form of its cordate, nearly 3-lobed leaves, which are also membranaceous, it scarcely differs from the diagnosis I have given of *Odontocarya hederifolia* (*huj.* vol. p. 64), a plant from Panama, which has a range as far eastward as northern Brazil, and is therefore not unlikely to extend to the much shorter distance southward of Upper Peru, where it is only supposed that Ruiz's plant was obtained; for no locality is given with the specimen. It is therefore reasonable to conclude that it is either an abnormal species of *Odontocarya* or that it belongs to a new genus. The former idea appears more probable if we consider the inner whorl to be formed by three sterile ovaries, such as I found to exist occasionally in the ♂ flowers of the Indian genus *Hematocarpus*, and in those of *Tiliacora*, where they look somewhat like emasculated stamens; this supposition is strongly supported by Dr. Eichler's drawing,

where the fifth figure in the bottom row upon the plate mentioned is either a deformed ovary or a monstrous stamen.

*Cocculus* is a cosmopolitan genus, some of its species belonging to the New World; *Nephroica* is widely distributed through Asia and its numerous islands; *Holopeira* is Indian and African; *Diploclisia* is found in Ceylon, the Indian peninsula, and along the Malayan coast.

**COCCLUSUS, DC.**—*Flores* dioici. *Masc. Sepala* 9, ordine ternario alternatim disposita, interiora majora, exteriora minora et bracteiformia, obovata, margine sæpius eroso-denticulata, æstivatione imbricata. *Petala* 6, sepalis opposita, biserialia, æqualia, sepalis interioribus minora, oblonga, infra medium angustiora, imo 2-auriculata, lobis filamenta amplectentibus. *Stamina* 6, subæqualia, unguibus petalorum affixa; *filamenta* petalis paulo longiora, teretia, apice incrassata; *antheræ* dorso introrsum adnatæ, rotundato-4-lobæ, 2-loculares, loculis collateralibus connectivo angustissimo interstinctis, utrinque rima diagonali bivalvatim hiantibus. *Ovaria* rudimentaria 3, centralia, punctiformia.—*Fem. Sepala et petala* masc. *Stamina* sterilia 6, petalis involuta, breviora, emasculata vel abortiva. *Ovaria* 3 vel 6, ovata, gibba. *Stylus* brevissimus, excentricus. *Stigma* subito horizontaliter deflexum, subteres, superne canaliculatum. *Drupæ* 3, transversim ovatæ, carnosæ, stigmate persistente proxime hilum notatæ; *putamen* osseum, reniformi-globosum, subcompressum, sulcis radiatis vel tortuosis exsculptum carinaque peripherica lævi signatum, uniloculare, loculo subcyclico circa condylum gytrato; *condylus* excentralis, internus, cochlearis, septo integro verticali in locellos 2 vacuos divisus, utrinque meatu parvo externo triangulari perforatus. *Semen* loculo conforme, extus convexum, intus planum; *integumentum* membranaceum, facie ventrali medio *chalazæ* ad condyli septum affixum; *embryo* intra *albumen* simplex carnosum, fere annularis, *cotyledonibus* foliaceis, carnosulis, lineari-oblongis, incumbentibus, *radicula* tereti supra ad stylum spectante duplo longioribus et multo latioribus.

Frutices scandentes, intra (rarius extra) tropicos totius orbis crescentes; folia alterna, petiolata, ovata, oblonga vel sublinearia; paniculæ racemosæ vel spicatæ, axillares, rarissime terminales, solitariae vel interdum plures, sæpius brevissimæ, ♂ multifloræ, ♀ paucifloræ, bracteis minimis donatæ; flores minusculi, pedicellati, sæpius glabri.

1. *Cocculus Carolinus*, DC. Syst. i. 524, Prodr. i. 98; A. Gray, Gen. Unit. St. i. 72, tab. 28;—Menispermum Carolinum,

*Linn. Sp.* 1468 ; *Lam. Dict.* iv. 97 ; *Willd. Sp. Pl.* iv. 825 ; *Mich. Fl. Bor.* ii. 242 ;—*Wendlandia populifolia*, *Willd. Sp.* ii. 275 ; *Poir. Dict.* viii. 796 ;—*Androphylax scandens*, *Wendl. Obs.* ii. 38 ;—ramulis teretibus, striatis, puberulis ; foliis sub-orbicularibus vel obovatis, imo truncatis aut cuneato-bisinuatis, interdum cordatis, summum versus paulo angustioribus, apice sæpius rotundatis aut obtusis, emarginatis et mucronatis, a basi 5-nerviis, adultis supra subglabris, subtus pallidioribus et molliter pubescentibus ; petiolo longiusculo, limbo brevior, puberulo : paniculis ♂ solitariis aut geminis, supra-axillaribus, ramis alternis, brevibus, imo bracteolatis, 1–3-floris ; interdum e ramulis novellis enatis, axillulis foliolo minore donatis, vel sæpe bracteola parva munitis, hinc racemum elongatum pubescentem folio longiorem mentientibus, pedicellis puberulis ; sepalis interioribus glabris ; petalis basi auriculatis : racemis ♀ supra-axillaribus, petiolum subæquantibus, alternatim ramosis, ramis bracteolatis, brevissimis, apice 1–3-floris ; ovarii 6, rarius abortu paucioribus.—In Americæ comitatibus meridionalibus : *v. s. in herb. variis* e Carolina, Florida, Louisiana et Texas.

As this species is not included in Dr. A. Gray's 'Manual of the Botany of the North-American States,' we may infer that the limit of its growth is entirely within the Southern States. It is subject to many variations: its larger leaves in general are nearly orbicular, rounded, emarginated, and mucronated at the apex, subcordate or bisinuous at the base, glabrous above, finely pubescent beneath, 4 inches long,  $4\frac{1}{4}$  inches broad, on a pubescent petiole  $3\frac{1}{2}$  inches long ; the younger leaves on the junior branches are more ovate, sharply or gradually diminishing to an acute summit, and scarcely 1 inch long, while at the intermediate stages there is a gradual change of form ; they are entire or sometimes slightly sinuated on the margin, and, in some instances, much lobed on their basal moiety, as in the variety *hederaceæfolius*. One or two short corymbiform panicles generally issue from the axils of the young branches, and are about  $\frac{1}{2}$  inch long ; in the upper axils the leaves are supplanted by a short acute linear bract, so that the inflorescence then assumes the form of an elongated terminal raceme : an axillary raceme as long as the leaf is not unfrequent ; but, though floriferous, the leaves are then abortive. Such an inflorescence is figured by Dr. Asa Gray in his 'Genera of the United States,' pl. 28.

Var. *hederaceæfolius* ;—*Menispermum hederaceæfolium*, *Dill. Elth.* 223, t. 178. f. 219 ;—*Menispermum Virginicum*, *Linn. Sp. Pl.* 1468 ; *Willd. Sp. Pl.* iv. 824 ; *Lam. Dict.* iv. 95 ;—folius

subdeltoideis, apice acutis, acuminatis et aristato-mucronatis, medio sinuato-constrictis, basin versus late expansis, margine sinuato-lobatis, imo truncatis vel sæpe profunde et late cordatis, rigidiusculis, a basi 5-nerviis, supra glabris, aut in nervis parce pubescentibus, subtus glaucis, pallidioribus, dense ferrugineo tomentosis; petiolo pubescente, limbo dimidio vel 3-plo brevior.—In Florida, Louisiana, et Texas: *v. s. in herb. Mus. Brit.*, Texas (Lindheimer); Texas (Wright 2).

This was first described and figured, in 1732, by Dillenius, again mentioned by Linnæus and Willdenow as a species distinct from *C. Carolinus*, and subsequently in 1796 by Lamarck, from a plant cultivated in the Jardin des Plantes; but it was not adopted by De Candolle or supported by American botanists. Although it has many claims to rank as a distinct species, I have not ventured to propose it, especially as it has scarcely been mentioned, even as a variety, by American botanists. The leaves are generally of darker hue, and covered beneath with dense ferruginous tomentum; they are  $1\frac{3}{4}$ –3 inches long,  $1\frac{3}{8}$ – $2\frac{1}{2}$  inches across the basal portion, on a slender petiole  $\frac{3}{4}$ – $1\frac{1}{4}$  inch long. The drupe is of a bright red colour, much larger in diameter than the putamen, the pericarp becoming lax when dry.

2. *Cocculus sagittifolius*, nob.; ramulis teneribus, ferrugineo tomentosis; foliis sagittato-trilobatis, imo in sinum latum cordatis, lobo superiore falcato-lanceiformi, acuminatissimo, lobis basalibus latissime rotundatis aut sinuato-truncatis, a basi 3-nerviis, nervis extus ramosis, coriaceis, supra fusco-virentibus, subnitentibus, in nervis venisque sparse et obsolete puberulis, subtus brunneo-glaucis, ferrugineo tomentosis; petiolo tenui, pubescente, limbo 4–5-plo brevior: paniculis ♂ in ramulis junioribus solitariis, axillaribus aut terminalibus; petiolo longioribus, pubescentibus, breviter alternatim ramosis, ramulis 2–3-floris; floribus bractea pilosula imo donatis; sepalis 6, 3 externis ovalibus, glabris, imo pilis paucis munitis, 3 interioribus suborbicularibus, glabris; petalis 6, sepalo 3-plo brevioribus, oblongis, carnosulis, fusco-opacis, glabris, apice obtusis, rarius denticulatis, imo inflexo-lobulatis.—In Texas: *v. s. in herb. Hook.*, San Felipe (Drummond).

This is a well-marked species, bearing much analogy with the preceding variety, and offering a transition state between its extreme forms and the following species, *C. oblongifolius*. It is a slender climbing plant, with apparently diverging pendent branchlets. The leaves are  $1\frac{1}{2}$ –2 inches long,  $1\frac{1}{4}$ – $1\frac{3}{8}$  inch across the basal lobes; the terminal lobe, which is two-thirds of the length of the leaf, at its origin is 4–6 lines broad, falcate, and

tapering into a very sharp acuminate point; the basal sinus is shallow or obsolete, and the very slender petiole is 4–6 lines long. The axillary panicle is 6 lines long, its branchlets seldom exceeding 1 line in length.

3. *Cocculus oblongifolius*, DC. Syst. i. 529, Prodr. i. 99; Hænk. Reliq. ii. 79;—ramulis gracillimis, subvirgatis, teretibus, striolatis, junioribus cinereo pubescentibus; foliis in ♀ ovatis, oblongis, in ♂ lineari-lanceolatis vel linearibus, sursum paulo angustioribus, imo cuneato-obtusis, rotundatis vel subcordatis, apice obtusis et mucronatis, a basi 3–5-nerviis, supra pallidis aut viridiusculis glaberrimis, subtus pallidioribus glaucis et opacis, marginibus revolutis, glabris vel subpuberulis; petiolo pubescente, limbo 4–12-plo brevior: panicula ♂ axillari, glaberrima; pedunculo tenuissimo, petiolo 2-plo longiore; ramis brevibus, alternis, 6–7-floris; pedicellis brevissimis, approximato-corymbulosis; sepalis 9, obovatis, 3-serialibus, extus gradatim minoribus; petalis 6, ovatis, sepalis interioribus 3-plo minoribus, apice eroso-denticulatis; staminibus 6, iis æquilongis; ovariis rudimentariis 6, punctiformibus: flore ♀ axillari; pedunculo solitario, petiolum excedente, medio apiceque bracteolato, flores 1–3 breviter pedicellatos gerente; sepalis 9, ut in maribus, marginibus eroso-denticulatis; petalis marium; staminibus nullis; ovariis 6, gibbosis, glabris; drupis subglobosis, glabris.—In Mexico: *v. s. in herb. Hook.*, Acapulco; Sonora alta, ♂ (Coulter, 656), ♀ (Coulter, 657); Matamoras (Berlandier, 2300); Tehuacan, Puebla (Galeotti, 1536): *in herb. Boiss.* ♀, Nueva Hispanha (Pavon).

The internodes are 4–12 lines long; the leaves are 1–2 inches long, 2–7 lines broad, on a twisted, very slender petiole 1–3 lines long. The ♂ panicle is 3–6 lines long, its branches, 1–2 lines long, each bearing from two to five flowers, which are minute: the peduncle of the ♀ inflorescence is 2 lines long; the drupe is 2 lines in diameter.

4. *Cocculus Leæba*, DC. Syst. i. 529, Prodr. i. 99; A. Rich. Fl. Seneg. i. 13; Hook. Nig. Fl. 97; Hook. & Th. Fl. Ind. i. 192;—*Leæba*, Forsk. Fl. Egypt. 172;—*Cocculus Cebatha*, DC. Syst. i. 527, Prodr. i. 99;—*Cebatha edulis*, Forsk. Fl. Egypt. 171;—*Cocculus Epibaterium*, DC. Syst. i. 530, Prodr. i. 100;—*Epibaterium pendulum*, Forst. Gen. 108, tab. 54;—*Menispermum Leæba*, Del. Fl. Egypt. Ill. 30, tab. 51. f. 2 & 3;—*Menispermum ellipticum*, Poir. Dict. Suppl. iii. 657;—*Cocculus ellipticus*, DC. Syst. i. 526, Prodr. i. 100;—*Menispermum edule*, Vahl, Symb. i. 80;

*Lam. Dict.* iv. 99; *Willd. Sp. Pl.* iv. 828;—scandens, ramulis gracillimis, virgatis, pendulis; foliis ellipticis vel oblongis, imo obtusis, a medio sursum angustioribus, apice obtusiusculis, mucronatis, e basi 3-5-nerviis aut triplinerviis, utrinque glabris et opacis, subtus cano-vel cinereo-glaucis, marginibus subrevolutis; petiolo tenui, interdum obsolete puberulo, limbo 6-plo brevior: paniculis ♂ axillaribus, solitariis vel geminis, brevissimis, flores 5-6 fere sessiles in capitulo subgloboso gerentibus, vel in ramis novellis ortis foliis deficientibus racemum elongatum interrupte spicatum mentientibus: paniculis ♀ axillaribus, solitariis vel geminis, petiolo sublongioribus; pedunculo flores 1-3 pedicellatos minime bracteolatos gerente.—In Senegalia, Ægypto, Abyssinia, ins. Cap. Verd. et India orientali: *v. s. in herb. Mus. Brit.* ♀, Senegal (Perottet); Ægypt (Wilkinson et Forskahl, sub *C. edule*); St. Iago Cap. Verd. (Forst. sub *Epibaterrium pendulum*): *in herb. Hook.*, Senegambia (Heudelot), Africa centr. (Vogel, 39), Abyssinia, Fazokel (Kotschy, 456), Egypt (Sieber), Arabia (Schimper, 354), Ethiopia (Broomfield, Kotschy), ins. Cap. Verd. (Forbes, Brunnen), Scinde (Vicary), Punjab (Dr. Thomson).

This species is widely diffused (but its limit is confined within the extensive northern tropical zone which runs across the continent of Africa, Arabia, and part of India)—indeed, almost everywhere between Cape Verde and the Punjab. It appears to grow in hot, dry, arid places, and to climb on bushes for its support. Its leaves are very small, not exceeding 8-15 lines in length, and 4-7 lines in breadth, upon a petiole  $1\frac{1}{2}$ -2 lines long. The axillary ♂ panicles, scarcely exceeding  $\frac{1}{4}$  inch in length, are furnished with five or six minute flowers, which have nine sepals in three decreasing series, the outer bracteiform, all suborbicular, membranaceous, glabrous, and erosely ciliated on the margin. The ♀ axillary peduncle is solitary, filiform, 4 lines long, supporting one to three flowers on short pedicels, bracteolated at base; the flower has also nine orbicular sepals, ciliated on the margins, six petals, six sterile stamens, and three glabrous ovaries. The putamen of the fruit is smaller than in the following species, not more than  $1\frac{1}{2}$  line (rarely 2 lines) in diameter; it is cochleiform with an obtuse basal angle, and has scrobiculated depressions on each face, the aperture of the condyle being large, lunate, and deep.

5. *Cocculus glaber*, W. & A. Prodr. i. 13;—*Cocculus lævis*, *Wall. in Cat.* 4975;—*Cocculus Læxiba*, *Hook. & Th. (in parte) Fl. Ind.* i. 192;—omnino glaber, caule scandente, ramulis gracillimis, virgatis, pendulis, striatis; foliis ovatis vel oblongis, sæpe

rhomboideo-elongatis, basi cuneatis, apice obtusis et mucronatis, triplinerviis, utrinque glabris, viridioribus, concoloribus, nervis tenuissimis rubescentibus; petiolo gracili, limbo 3-plo brevior: racemo ♂ solitario, axillari, nano, petiolo dimidio brevior, glabro; floribus paucis, agglomeratis, vel inflorescentia in ramulis novellis, foliis delapsis, racemum elongatum interrupte spicatum simulante: pedunculo ♀ axillari, semper solitario, 1-3-floro, e gemma tomentosa supra-axillari enato, petiolo dimidio brevior.—In India orientali: *v. s. in herb. Soc. Linn.* ♂ et ♀, Madarapatam (Wall. Cat. 4975); *in herb. Hook. et meo*, Coimbatore (Gardner), prope Coimbatore (Wight, 43).

This species has been amalgamated with the preceding by the authors of the 'Flora Indica;' but, from the following details, it will be seen to be quite distinct. As far as our knowledge extends at present, the *C. Leaba* does not spread further to the southward than the Punjab, while this species seems peculiar to the southern portion of the peninsula of India. It much resembles some varieties of the former; but its leaves are thinner in texture, larger, longer, differently nerved, and furnished with a longer petiole: the ♂ inflorescence, generally binate in the former, is here always solitary in the axils; and, instead of nine, the flower has only six sepals; the fruit is also much larger. Its leaves are  $1\frac{1}{4}$ - $1\frac{3}{4}$  inch long,  $\frac{1}{2}$ - $\frac{3}{4}$  inch broad, on a very slender petiole 5 lines long. The axillary ♂ peduncle is only 1 line long, bearing three sessile minute flowers at its apex; the flower, with a minute bract at the base, has six sepals, the three outer ones, cuneately oblong, half the length of the three inner ones, which are cuneately rhomboid, broad, concave, all being glabrous, opaque, with membranaceous ciliate margins; six petals, half their length, cuneately oval, with involuted basal lobes, glabrous, submembranaceous, with six stamens of equal length seated on their claws. The ♀ peduncle is 2-3 lines long, with minute flowers: the drupes are 4 lines in diameter; the putamen is much larger than that of the preceding species, is cochleiform, with a sharp salient basal angle, is 3 lines in diameter, and has two concentric rows of short transverse ridges with intervening furrows on each face, and a very deep condyle.

6. *Cocculus recisus*, nob.;—ramulis tenerriinis, dealbatis, glabris; foliis oblongis, inum versus late truncatis vel obtusis, lateribus plus minusve profunde inciso-lobatis, lobis utrinque 1 aut 2, subbrevis et obtusis, sæpe (præsertim in junioribus, ob lobos fere obsoletos) subhastatis, a medio gradatim angustioribus, apice obtusis et mucronatis, e basi 3-5-nerviis, nervis fere immersis, utrinque furfure incano vel fulvo glaucis, et paulo puberulis; petiolo tenuissimo, limbo 6-9-plo brevior, cano



pubescente: racemo ♂ in ramulis novellis axillari, solitario, brevissimo, floribus 3-4 fere obsolete pedicellatis bracteaque pilosula munito: sepalis 9, quorum 6 minuta, marginibus ciliatis, 3 interioribus multo majoribus, cuneato-orbicularibus, pallidis, glabris; petalis 6, multo minoribus, oblongis, pallidis, apice 3-denticulatis, imo auriculatis, lobis inflexis: in ♀ inflorescentia simillima; sepalis ovalioribus; petalis apice retusis; ovariis glabris; stylo brevi; stigmate horizontali; drupis minimis, carnosis, glabris.—In India orientali: *v. s. in herb. Hook.* ♂ et ♀, Punjab, Lahore (Falconer, 85; Dr. Thomson); ♀, Moultan (Edgeworth, 1146); ♂, Afghanistan (Griffiths, 1295).

A species very distinct from *C. Leaba*, and seemingly confined to the dry arid countries of the Punjab and Afghanistan. The young floriferous branches with immature leaves can hardly be distinguished from some varieties of *C. Leaba*; but wherever the leaves are fully grown, the species is immediately recognized by their deeply incised obtuse lobes; their surface is more rugose; they are very pallid and of a whitish glaucous hue. The leaves in the more matured specimens are 12-21 lines long; in the latter case, where they are more developed, they are 16 lines broad across the basal lobes, and 10 lines broad across the foot of the larger middle lobe, the petiole being only 2 lines long. The inflorescence is only found in the axils of very young branches, where the leaves have not grown to a greater length than 4 lines, upon a petiole 1 line long; it is then barely 1 line long, bearing three or four minute flowers: these have nine ovate sepals in decreasing series, their margins being furnished with long ciliated hairs; the putamen is very small, only 1½ line in diameter.

### 35. NEPHROICA.

This genus, established by Loureiro, was disregarded by botanists for nearly sixty years, until I first pointed out its peculiar structure and the differences which separate it from *Cocculus*, with which genus it had been associated. De Candolle placed its typical species in a particular section, on account of its monœcious flowers, Loureiro having erroneously stated that male and female flowers are found on the same plant; but his original specimen in the British Museum does not present this character, nor have I found it in any other of its species. I have elsewhere stated that the authors of the 'Flora Indica' have declined to admit this genus, fusing *Nephroica*, *Holopeira*, and *Diploclisia* into *Cocculus*, because they attach no importance to the shape

of the petals, asserting that it is not even constant in each species; and thus, after their singular method, they agglomerated most of the species of *Nepthroica* enumerated below into a single species of *Cocculus*. The principal reason they assign is not supported circumstantially; for I have carefully examined scores, nay, hundreds of flowers in the genus, and have found their shape and proportion constant in each species. In every case the petals are far more elongated than in *Cocculus*, and are divided from their apex to near their middle into two extremely attenuated caudate points, usually inflected above, while at their base they have two short auricular lobes, which are involuted round the base of the stamens. The filaments are gradually thickened at the apex into a clavate form, the anthers being globular, parallel, dorsally attached to the filament, with a very narrow connective between them; they are therefore introrse, and each lobe bursts by a horizontal suture. The female flower has sepals and petals like those of the male, and six effete stamens; they have three or six free ovaries each, with a stigma different from that of *Cocculus*. There is not much dissimilitude in the structure of the putamen and seed in these two genera.

In adopting Loureiro's generic name I have corrected a typographical error, by reforming it into *Nepthroica*, a name evidently derived from *νεφρός* (*ren*), *εἶκω* (*similis sum*), which expresses the reniform shape of its putamen: we thus avoid the inconvenience of forming three distinct syllables out of three terminal vowels.

**NEPHTROICA**, Lour.—*Flores* dioici. *Masc.* *Sepala* 9, in ordine ternario alternatim disposita, gradatim majora. *Petala* 6, sepalis interioribus multo breviora, lineari-oblonga, imo utrinque auriculata, lobis involutis filamenta amplectentibus, apice in lacinias 2 angustissimas acutas sæpius paulo inflexas profunde fissis. *Stamina* 6, libera, petalis opposita, his subæquilingua vel longiora; *filamenta* suberecta, apice sensim incrassata; *antheræ* subglobosæ, sub-4-lobæ, dorso affixæ, 2-loculares, loculis connectivo angustissimo sejunctis, utrinque rima horizontali 2-valvatim dehiscentibus. *Ovaria* sterilia 3, punctiformia, centralia.—*Fæm.* *Sepala* et *petala* ut in masc. *Stamina* sterilia 6, petalis opposita; *filamenta* filiformia, brevia, apice 2-punctata. *Ovaria* 6, rarissime pauciora, gibboso-oblonga, gynæcio 6-lobato imposita, 1-locularia, 1-ovulata, ovulo ad faciem interiorem affixo. *Stylus* brevis, excentralis. *Stigma* elongatum, teres, reflexum, superne canaliculatum. *Drupæ* 6, vel abortu pauciores, ovatæ, gibbæ, carnosæ, paulo supra basin stylo persistente notatæ; *putamen* reniformi-orbiculatum, subcompressum, 1-loculare, loculo fere annulari

circa condylum gytrato, utrinque serie interiore lilarum alteraque concentrica exteriori irregulariter sulcato; *condylus* internus, cochleatus et bicameratus, extus utrinque profunde excavatus et foramine lunato marginato perforatus. *Semen* loculo conforme, dorso rotundatum, ventre subconcauum; *integumentum* tenue, latere ventrali linea incrassata (chalaza) ad condylum affixum; *embryo* in *albumine* simplici carnosulo, subcyclicus; *cotyledonibus* crassiusculis, foliaceis, lanceolato-oblongis, incumbentibus, *radicula* tereti supera ad stylum basalem spectante 3-plo latioribus et 4-plo longioribus.

Frutices *scandentes vel suberecti, per Asiam tropicam et insulas dispersi*; folia *petiolata, ovata vel lanceolata, e basi 3-5-nervia*; paniculæ ♂ *axillares, racemosæ, folio breviores, ramis 3-4-floris*; racemi ♀ *axillares, breves, pauciflori.*

1. *Nephroica sarmentosa*, Lour. Fl. Coch. ii. 692;—*Nephroica pubinervis, nob. olim in Hook. Kew Journ.* iii. 259;—*Cocculus Nephroia, DC. Syst.* i. 531, *Prodr.* i. 100;—*Menispermum reniforme, Spr. Syst.* ii. 156;—scandens, ramulis teretibus, retrorsum pubescentibus; foliis ovali-oblongis vel obpyriformi-oblongis, imo rotundatis, sæpe ultra medium gradatim angustioribus, apice rotundiusculis, mucronatis, interdum subemarginatis, e basi 5-nerviis, utrinque glabris et fere concoloribus, opacis, valde reticulatis, subtus puberulis, nervis venisque reticulatis vix prominulis; petiolo brevi, pubescente, limbo 6-8-plo brevior: racemo ♂ e pulvinari sericeo supra-axillari enato, folio brevior, puberulo, ramis alternis, brevibus, 3-floris, floribus pedicellatis; sepalis 9, triseriatis, exterioribus bracteiformibus, margine ciliatis, interioribus multo majoribus, ovatis, submembranaceis, concavis, marginibus eroso-denticulatis, glabris; petalis 6, duplo brevioribus, lineari-oblongis, apice in lacinias acutissimas subbreves fassis, imo breviter incurvo-auriculatis: racemo ♀ axillari, pubescente, folio 2-plo longiore.—In China et Java: *v. s. in herb. Mus. Brit., Cochinchina (Lour.)*; Java, ♂ et ♀ (Banks & Soland.); *in herb. Hook.* ♂, Hongkong (Champion, 202).

Loureiro states that ♂ and ♀ branches are found on the same plant; but he was mistaken on this point. The branches are slender, with axils  $1-1\frac{3}{4}$  inch apart; the leaves are  $2-2\frac{3}{4}$  inches long,  $1-1\frac{3}{4}$  inch broad, on a petiole 3-5 lines long. The ♂ panicle is  $1\frac{3}{4}$  inch long, with few branches, 2 lines long, supporting three flowers on pedicels 1 line long: sometimes two of the flowers are abortive, and the panicle thus becomes a simple raceme.

2. *Nephroica hexagyna, nob.*;—*Cocculus hexagynus, Coleb. Linn.*

*Trans.* xiii. 63;—*Menispermum hexagynum*, *Roxb. Fl. Ind.* iii. 815;—ramulis scandentibus, teretibus, cauo tomentosis; foliis obovatis, sæpe subcordatis, apice obtusis vel emarginatis, mucronulatis, e basi 3-5-nerviis, supra subglabris aut in nervis tantum puberulis, subtus pallidioribus, subpubescentibus; petiolo tenui, pubescente, limbo 5-plo brevior: racemis ♂ axillaribus, solitariis aut geminis, petiolum subæquantibus aut longioribus, alternatim 3-5-floris, puberulis, aut sæpe in ramulis novellis foliis abortientibus enatis, hinc racemum elongatum axillarem aut terminalem folium superantem mentientibus; sepalis glabris, interioribus 2-plo majoribus, ovalibus, fuscis; petalis paulo brevioribus, lineari-oblongis, apice usque ad medium acutissime bifissis: racemis ♀ axillaribus, solitariis, petiolo 3-plo longioribus, pubescentibus; pedicellis 1-floris, alternis, imo et medio bracteolatis, his et floribus glabris; sepalis et petalis marium; staminibus sterilibus 6; ovaris 6, glabris.—In China et Japonia: *v. s. in herb. Soc. Linn.*, in Calcutta cult. (Wall. Cat. 4968); *in herb. Mus. Brit.*, China (Staunton), Calcutta (Wallich, Roxburgh, sub nom. *Menisp. parabolicum*); *in herb. Hook.*, China (Millett, in parte); Amoy (Welford, 458).

This species is very near the preceding, but is recognized by its obovate leaves, truncated or more generally cordate at base, upon longer petioles; its petals, also, are more deeply cleft. Its leaves are  $1\frac{3}{4}$ - $2\frac{1}{4}$  inches long,  $1\frac{1}{2}$ - $1\frac{3}{4}$  inch broad, on a petiole 4-6 lines long: the ♂ panicle is  $\frac{1}{2}$ - $1\frac{1}{2}$  inch long, with branches 2 lines long, each bearing three pedicellated flowers: the ♀ raceme is 1 inch long, with alternate pedicels 1-2 lines long, abortively 1-flowered; from the existence of bracts in the middle of the pedicel, it ought normally to be 3-flowered; the flower has six ovaries upon a raised receptacle, each with a long, horizontally deflected, subulate style; the putamen is small, not more than 2 lines in diameter.

3. *Nepthroica ovalifolia*, nob. ;—*Cocculus ovalifolius*, *DC. Syst.* i. 526, *Prodr.* i. 99; *Blume, Bijd.* 25;—*Cocculus umbellatus*, *Steud. Nom.* 392;—*Menispermum ovalifolium*, *Vahl in Pers. Ench.* ii. 628; *Spr. Syst.* ii. 157; *Cur. post.* iv. 143;—ramulis retrorsum pilosis, striolatis; foliis ovalibus, imo rotundis, supra medium apicem versus angustioribus, acumine anguste obtusulo mucronato, e basi 5-nerviis, supra parce puberulis, subtus pallidioribus, puberulis et in nervis tenuibus vix pronunulatis pilosulis; petiolo tenui, puberulo, limbo 3-plo brevior: paniculis ♂ axillaribus, petiolo brevioribus, pedunculo apice 3-5-ramoso; ramis approximatis, fere umbellatis, 3-floris; sepalis 9, obovatis, fusco-membranaceis, glabris; pe-

talis 6, his brevioribus, lineari-oblongis, apice fere ad medium in lacinias acutas subdenticulatas fassis, imo auriculatis, staminibus vix dimidio longitudinis unguibus affixis.—In China et ins. Sandwichensibus: *v. s. in herb. Hook., Mus. Brit., et Lindley*, Chusan; Korea, Chusan (Welford, 924); Woabu (Barclay, 1271).

This species is easily distinguished from the two preceding by the more acuminate shape of its oval leaves, its longer petioles, and its shorter axillary ♂ panicles; the bifid apical segments of the petals are eroso-denticulated. The leaves are  $2\frac{1}{2}$  inches long,  $1\frac{1}{2}$  inch broad, on a petiole 9 lines long. The ♂ panicles are 6–8 lines long, their branchlets 1–2 lines long.

4. *Nephroica caudata*, nob.;—ramulis tenuibus, pilis retrorsis dense vestitis; foliis ellipticis, imo acutis et interdum breviter constrictis, apicem versus subito angustatis et breviter acuminatis, acumine angusto et obtusulo, e basi 5-nerviis, nervis subrectis, ultra medium productis, et cum alteris e costa enatis et parallelis anastomosantibus, submembranaceis, supra viridibus, sparse pilosis, subtus paulo pallidioribus, subpubescentibus, et in nervis vix prominulis valde pilosis; petiolo tenui, pubescente, limbo 3-plo brevior: paniculis ♂ geminis, supra-axillaribus, petiolum æquantibus, breviter ramosis; ramis alternis, circiter 6, sub-3-floris; rachi, ramulis, pedicellis bracteolisque pubescentibus; sepalis 9, suborbiculatis, glaberrimis, quorum 3 exteriora minora, margine ciliata; petalis lineari-oblongis, imo breviter auriculatis, apice in lacinias 2 acutas ad tertiam partem fassis.—In Japonia: *v. s. in herb. Hook., Nagasaki* (Oldham, 29).

A species allied to *N. ovalifolia*, from which it differs in its larger, more acuminate leaves, cuneately narrowed at base, and in its longer petiole. The leaves are  $3\frac{1}{2}$ –4 inches long,  $2\frac{1}{4}$  inches broad, on a petiole 12–13 lines long. The axillary ♂ panicle is 1 inch long, the rachis slender and bare for half its length, its branches 2 lines long, about 3-flowered.

5. *Nephroica Thunbergii*, nob.;—Cocculus Thunbergii, *DC. Syst.* i. 524, *Prodr.* i. 98;—Menispermum orbiculatum, *Thunb. (non Linn.) Fl. Jap.* 194; *Lam. Dict.* iv. 97;—ramulis teneribus, striatis, pubescentibus; foliis obovatis, imo sinu levi cordatis, ultra medium gradatim angustioribus, apice obtusis et callosomucronatis, e basi 5-nerviis, nervis extus valde ramosis, supra subnitidis, sparse puberulis, subtus pallidioribus, glaucis, subpuberulis, in nervis pilosulis; petiolo tenui, pubescente, limbo 5-plo brevior: panicula ♀ axillari, pubescente, folium æquante; ramis brevibus, alternis, bracteolatis;

ramulis brevissimis, apice 3-floris; pedicellis brevissimis, glabris; sepalis 9, 3-seriatis, glabris, fusco-membranaceis, exterioribus bracteiformibus, interioribus majoribus, suborbicularibus, concavis; petalis 6, paulo brevioribus, oblongis, apice breviter bifissis, laciniis subdivaricatis, imo lobis parvis auriculatis inflexis, glabris, fuscis; ovariis 6, glabris; drupis pisi-formibus.—In Japonia: *v. s. in herb. Hook.*, Azama (Oldham, 30), Semada (Oldham, 231), Nagasaki (Oldham, 28 in parte).

This species has long been known: it is a plant climbing upon shrubs, with somewhat slender branches and distant axils; its leaves are 4–4½ inches long, 2⅔–2½ inches broad, with a wide basal sinus 1½–2 lines deep, the petiole measuring 6–7 lines. I have seen only the female plant, whose raceme-like axillary inflorescence is 2½–3½ inches long, with alternate branches 2 lines long and 4–5 lines apart, the ultimate pedicels bearing two alternate bracteoles in the middle; the flowers are rather more than a line in diameter in bud; the drupes are of a dark colour, with a bluish bloom, enclosing a putamen 2½ lines in diameter. Sometimes the axillary inflorescence is much shorter than the usual length given above.

6. *Nephröica dilatata*, nob.;—*Cocculus Bantamensis*?, *Bl. Bijd.* 26; *Walp. Rep.* i. 93;—ramulis teretibus, striatis, subpuberulis; foliis deltoideo-orbicularibus, imo sinu rotundo cordatis, hinc sursum gradatim angustioribus, in medio paulo constrictis, apice valde obtusis, emarginatis et mucronatis, coriaceis, e basi 5-nerviis, utrinque glaberrimis, supra pallidis, subtus pallidioribus, nervis tenuibus prominulis; petiolo brevi, striato, subpuberulo: racemo ♀ axillari, petiolo longiore; ramis paucis, alternis, flores paucos brevissime pedicellatos gerentibus; drupis glabris, piso minoribus.—In China et Java: *v. s. in herb. Hook.*, prov. Kianang (Staunton).

This species appears to correspond with the *Cocculus Bantamensis*, Bl.; but, uncertain of this, I do not adopt that specific name. It differs from all the preceding in its comparatively broader, more deltoid leaves, cordate at base, glabrous below, and in having much stouter and shorter petioles. The leaves are 2¼–3 inches long, 2⅓ inches broad, with a basal sinus 2 lines deep, on a petiole 6–9 lines long; the fructiferous raceme is 1 inch long, bearing about three branches, each with one to three pedicellated drupes 3 lines in diameter.

7. *Nephröica hastata*, nob.;—*Menispermum hastatum*, *Lam. Dict.* iv. 98;—*Cocculus hastatus*, *DC. Syst.* i. 522, *Prodr.* i. 98;—*Cocculus dianthera*, *Hook. Arn. Bot. Beechey Voy.* p. 167;—ramulis teretibus, flexuosis, pilis brevibus, retrorsis,

puberulis; foliis hastato-oblongis, imo cordatis et subito auriculato-expansis, lobis rotundiusculis, lateribus fere parallelis, apice rotundatis, emarginatis et mucronulatis, e basi 5-nerviis, utrinque concoloribus et in nervis puberulis, reticulato-venosis, marginibus subreflexis; petiolo tenui, pubescente, limbo 7-9-plo brevior: panicula ♂ supra-axillari, petiolum paulo excedente, pubescente; ramis 3-4, paucifloris, floribus alternis, pedicellatis, aut inflorescentia e ramulo novello aphylo racemum longiusculum mentiente; sepalis interioribus suborbicularibus, glabris, membranaceis; petalis 6, sublinearibus, apice acutissime et profunde fissis, imo longiuscule auriculatis, lobis involutis.—In China: *v. s. in herb. Hook.*, China (Millett et Vachel).

A species allied to the preceding; but the leaves are somewhat smaller, more deeply cordate, with rounded basal lobes, with more parallel sides, and rounder at the apex, much shorter petioles, a dissimilar inflorescence, and differently shaped petals. The leaves are  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch long, the basal sinus being 1–2 lines deep; they are  $1\frac{1}{4}$  inch broad across the basal lobes, 9–10 lines broad in the middle and towards the rounded summit, the petiole being 2–3 lines long. The axillary ♂ panicle is 6 lines long; the pseudo-raceme has a rachis  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches long, with panicles 3 lines long and 3 lines apart; the petals, somewhat shorter than the sepals, are cleft to one-third of their length into two very narrow subulate segments, the stamens (half their length) being affixed to their claws.

8. *Nephroica mollis*, nob.;—*Cocculus mollis*, *Wall., Hook. & Th. Fl. Ind. i. 193*;—ramulis scandentibus, striatis, glabris, junioribus retrorsum pubescentibus; foliis obovatis, imo rotundatis aut obsolete cordatis, a medio gradatim angustioribus, apicem versus paulo constrictis et acuminatis, e basi 5-nerviis, supra sparse pubescentibus et in nervis cano tomentellis, subtus cinereo-glaucis et molliter pilosulis, nervis paulo prominulis; petiolo tenui, pilosulo, limbo 3-4-plo brevior: panicula ♂ supra-axillari, e fascicula pilorum orta, petiolo brevior, 3-5-flora; floribus pedicellatis.—In India orientali: *v. s. in herb. Soc. Linn., Nepalia* (Wall. Cat. 4973); *in herb. Hook., Khasya* (Hook. & Th.).

The branches are slender; the leaves are 2– $3\frac{1}{2}$  inches long,  $1\frac{1}{4}$ – $1\frac{7}{8}$  inch broad, on a petiole 7–10 lines long. The supra-axillary panicle is 6 lines long, the pedicels 1 line, the bracts minute, all cano-pubescent, the flowers glabrous; the raceme-like floriferous branchlet is  $3\frac{1}{2}$  inches long, with alternate short panicles; the sepals are ovate; the petals are nearly their length, narrowly oblong, shortly cleft at the apex, with two small in-

flected basal lobes; the stamens are as long as the petals: the ♀ raceme is somewhat longer; the putamen is about 2 lines in diameter, with a large lunate aperture on each side of the condyle.

9. *Nepbroica triloba*, nob.;—*Menispermum trilobum*, *Thunb. Fl. Jap.* 194; *Lam. Dict.* iv. 95; *Willd. Sp.* ii. 825;—*Cocculus trilobus*, *DC. Syst.* i. 522, *Prodr.* i. 98;—ramulis scandentibus, cinerascentibus, retrorsum hispidulis; foliis profunde trilobatis, imo latis et subcordatis, lobis basalibus subdivaricatis, subfalcatis, acutis vel obtusis, lobo intermedio deltoideo vel lanceolato-triangulari, acuto et mucronato, e basi 5-nerviis, utrinque sparse villosulis, supra lucidis, subtus glaucis; petiolo brevi, tereti, imo reflexo, subsericeo-villoso, limbo 5–6-plo brevior: panicula ♂ axillari, petioli longitudine vel brevior, pilosulo; pedunculo apice pedicellos 3–5 crebre alternos gerente; floribus hinc corymbulosis; sepalis 6, bracteis 2–3 villosis suffultis, interioribus majoribus, glabris, membranaceis, orbiculatis, concavis; petalis 6, lineari-oblongis, fere ad medium acutissime fissis, laciniis denticulatis, imo lobis parvulis inflexis.—In Japonia et China: *v. s. in herb. Hook. ♂, Nagasaki* (Oldham, 28 in parte); hort. Kew. cult.; ins. Formosa (Oldham, 8); *in herb. Mus. Brit.*, prov. Kianang (Staunton).

A species very different from *N. hastata*, the leaves being more deeply cordate, the basal lobes more auricular, more salient, and sometimes acute at their extremity, leaving a deep sinus between each and the terminal lobe, which is in the form of a long acute triangle. The leaves are  $1\frac{3}{4}$ –2 inches long, the basal sinus being 1–2 lines deep; they are  $1\frac{1}{2}$ –2 inches broad across the auricular lobes, which, when acute, are 1 inch long; when the lobes are rounded, the terminal part is broader, being  $\frac{3}{4}$ –1 inch broad at its base; when they are acute, the middle portion is only  $\frac{1}{2}$ – $\frac{5}{8}$  inch broad, thus forming an acute triangle 1– $1\frac{1}{2}$  inch long; the petiole is 4 lines long. The ♂ panicle (or rather corymbulose raceme) scarcely exceeds 4 lines in length, the peduncle being furnished at its apex with from three to five closely alternating pedicels  $\frac{1}{2}$ –1 line long; the flowers are minute, scarcely more than  $\frac{1}{3}$  line in diameter in bud; the margins of the sepals are more or less denticulated; the petals are somewhat shorter, with their acute segments denticulated, the stamens being half their length.

10. *Nepbroica cuneifolia*, nob.;—ramulis valde tenuibus, volubilibus, subpuberulis; foliis oblongis, imo longe cuneatis, apice truncato-rotundis, profunde emarginatis et breviter mucronulatis,



e basi longissime 3-nerviis, et mox penninerviis, nervis tenuissimis, anastomosantibus, valde reticulatis, submembranaceis, utrinque concoloribus, læte viridibus, lucidulis, supra glaberrimis, subtus in nervis sub lente puberulis, marginibus vix ciliolatis; petiolo brevissimo, tenuissimo, puberulo: panicula ♂ axillari, folio 4-plo brevior; rachi puberula, tenui, apice 3-ramosa, ramis brevibus, apice 3-floris, floribus brevissime pedicellatis; sepalis 9, triseriatis, gradatim majoribus, seriebus 2 exterioribus parvis, extus pilosulis, interioribus 2-plo longioribus, orbicularibus, concavis, glabris; petalis 6, lanceolato-oblongis, glabris, apice profunde fassis, laciniis acutis, incurvis, lobis basalibus involutis; staminibus 6, dimidio brevioribus, petalis adumbratis.—In insula Formosa: *v. s. in herb. Hook.*, ins. Formosæ ora orientali (Welford, 526).

This forms a species perfectly distinct from all others of the genus, near *Holopeira laurifolia* in the character of its nervation and the shining surface of the leaves: these are acute at the base, cuneately expanding upwards with straight sides, while the apex by its deep emargination forms two rounded lobes, with a sinus between them 1 line deep; they are  $1\frac{1}{2}$  inch long, 7–10 lines broad at the summit, the petiole being 2–2½ lines long; the peduncle of the axillary panicle is 4 lines long, its apical rays 1 line long, the flowers minute.

11. *Nephroica cynanchoides*, nob.;—*Cocculus cynanchoides*, Presl, *Reliq. Hænk.* ii. 79;—humilis, ramulis volubilibus, teneribus, teretibus, striatis, fuscis, retrorsum puberulis; foliis ovatis, apice obtusis vel breviter acuminatis, rotundiusculis vel obtusis, vix emarginulatis et mucronulatis, e basi 5-nerviis, utrinque subglabris (junioribus dense pubescentibus), pallide viridibus et concoloribus, subtus nervis prominulis et obsolete puberulis; petiolo brevi, semitereti, pubescente, limbo 3-plo longiore: panicula ♂ axillari, petiolo vix longiore, alternatim 3–5-ramosa, ramis brevibus, alternatim 3–7-floris, floribus pedicellatis; vel inflorescentia sæpe e ramulo novello aphylo racemum folium 2-plo superantem mentiente; sepalis 9, interioribus multo majoribus, ovalibus, concavis, subfuscis, glabris; petalis 6, paulo brevioribus, lineari-oblongis, apice profunde et acutissime 2-fassis, lobis basalibus parvis, involutis.—In ins. Philippinis, China, et Serampoor: *v. s. in herb. Lemann.*, Serampoor; *in herb. Lindley.*, Isle de France, hort. bot. cult. (Bouton); China: *in herb. Hook. et Mus. Brit.*, ex *Mus. Paris.*, ins. Bourbon cult. (Richard).

This species is well described by Presl: its leaves are smaller than in any of the others; they seldom are more than  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch

long,  $\frac{3}{4}$ – $1\frac{1}{8}$  inch broad, on a petiole 2 lines long; in the cultivated specimen from Bourbon they attain a length of 2 inches and a breadth of  $1\frac{1}{4}$  inch, on a petiole 3 lines long; in the specimen from China the leaves are a little broader and more oval. Presl states that in the typical plants from Luzon the leaves are scarcely 1 inch long, and ovate; and this occurs in one of the specimens above quoted. The ♀ axillary peduncle is only 1–2 lines long, bearing a few 1-flowered pedicels 1 line long; the flowers have nine sepals, six petals, and three ovaries. In the specimens I have seen the ♂ panicle is 4–5 lines long, the branches 3 lines, the pedicels 1 line long.

The authors of the 'Flora Indica' (p. 190) consider this species (which they had not seen) to be identical with my *Hypserpa nitida* from Hongkong; but in this they are certainly mistaken.

12. *Nepthroica pycnantha*, nob. ;—ramulis scandentibus, teneris, retrorsum pilosis; foliis deltoideo-oblongis, imo truncatis, sursum gradatim acutatis, apice obtusulo et mucronato, e basi 5-nerviis, reticulatis, in nervis utrinque pilosis; petiolo brevi, pilosulo, limbo 6-plo brevior: panicula ♂ e fasciculo pilorum supra-axillari orta, cinereo pubescente; rachi petiolo æquilonga, apice ramos 3–4 æquilongos umbellatos divaricatos gerente; ramis creberrime bracteolatis et spicatis, plurifloris; bracteolis imbricatis; pedicellis brevibus, e bracteolis enatis; floribus pro mole majusculis; sepalis 6, ovato-ellipticis, subcarnosis, glabris, extus bracteis 2–3 puberulis donatis; petalis 6, paulo brevioribus, lineari-oblongis, apice minus profunde acute 2-dentatis, lobis basalibus parvis, involutis; staminibus 6; ovarii 6 rudimentariis supra gynæcium insitis.—In China: v. s. in herb. Lindley., Macão (Vachel, 242).

A species much allied to the preceding, differing in its very triangularly oblong leaves truncated at base, and by the remarkable character of its inflorescence. The leaves are 17–20 lines long, 10–13 lines broad, on a petiole 3 lines long; the peduncle is 3 lines long, its branches of the same length, which are crowded with minute imbricated bracts, from each of which is a pedicel  $\frac{1}{2}$  line long, supporting a flower which, in the bud, is oval and  $\frac{3}{4}$  line long.

13. *Nepthroica Ferrandiana*, nob. ;—*Ferrandia oleifolia*, Gaud. Freyc. Voy. 477, tab. 101 ;—*Cocculus Ferrandianus*, Presl, Rep. Bot. i. 154; Walp. Rep. i. 94;—*Cissampelos?* acuminata, DC. Syst. i. 538, Prodr. i. 102;—ramulis tenuibus, scandentibus, retrorsum strigoso-sericeis, demum glabris; foliis oblongo-lanceolatis, utrinque attenuatis, imo obtusis, summum versus gradatim acutioribus et subacuminatis, mu-

cronatis, e basi longe 3-nerviis, cum nervulis 2 alteris mox evanescentibus aut inconspicuis, utrinque concoloribus, supra glabris, in nervis sulcato-immersis puberulis, subtus in nervis pubescentibus, marginibus revolutis, subciliolatis; petiolo tenui, puberulo, limbo 5-7-plo brevior: panicula ♂ supra-axillari, petiolo longiore, pubescente; pedunculo petiolum æquante, apice 3-ramoso, ramis pedicellos 1-floros 4-6 bracteolatos gerentibus; sepalis 6, ellipticis, subglabris, margine ciliolatis, bracteis minoribus 1-2 circumdatis; petalis 6, paulo minoribus, lineari-oblongis, apice in lacinias 2 acutissimas incisissimis, fuscis.—In ins. Sandwicensibus: *v. s. in herb. De Candolle.*, Owhyhee (Gaud.); *in herb. Mus. Brit.*, Owhyhee (Cook, Third Voy.).

This species may be recognized by its more or less lanceolate leaves. It must not be mistaken for *Holopeira lonchophylla*, from Oahu, to which it bears some external resemblance, and with which it has been confounded. Its leaves in the typical specimens are acute at the base, 2½ inches long, 8-10 lines broad, on a petiole 4 lines long. In Capt. Cook's specimens they are nearly the same length, but 10-12 lines broad, on a petiole 5 lines long. The peduncle is 4 lines long, its branches 5 lines long, bearing about six alternate pedicels ½ line long. The drupes are glabrous, with a putamen 2½-2¾ lines in diameter.

### 36. HOLOPEIRA.

In describing *Cocculus* and *Nephroica*, with which *Holopeira* has been amalgamated by the authors of the 'Flora Indica' and the 'Genera Plantarum,' I have stated many of the reasons for maintaining their separate integrity. *Holopeira* is distinguished from those genera by its broader oblong petals, which are cuneate at base, always obtusely and in a minor degree cleft or only emarginate at the apex (not entire as in *Cocculus*, and not extremely acute and deeply incised as in *Nephroica*), and by their lateral lobes springing from the middle on each side (not basal, as in those genera): the stigma is more or less elongated, suddenly reflected over the apex of the ovary, channelled above, with crenately inflected margins, and truncated at the extremity: in *Nephroica* the sepals and petals are quite glabrous, in *Holopeira* they are frequently clothed with very long sericeous hairs. But the chief distinction, one of manifest structural difference, lies in the very peculiar form of its putamen, which is pale, often thinly crustaceous, orbicular, somewhat flattened on the opposite faces, and there marked with numerous radiating, finely

tuberculated striæ; it has a broad and somewhat flattened periphery, with a remarkably acute projecting keel running round it between two grooves; the condyle is altogether central and quite circular, consisting of two broad and deep open chambers, with a finely toothed margin, and separated by a septum formed of two thin united laminae, having a central hole, sometimes very large; the putamen is thus cleanly pierced through its centre by three distinct parallel holes (whence the generic name). This central transperforation is somewhat analogous to the structure of *Stephania*; but there the condyle is thin and disciform, marked by a single foramen. The structure in *Holopeira* is so very peculiar, and so entirely different from that of *Cocculus* and *Nephroica*, that I cannot conceive why its generic validity should be disputed by botanists who, in many other extensive families, have recognized far more trivial discrepancies.

**HOLOPEIRA**, nob.—*Flores* dioici. *Masc. Sepala* 6, ternatim et alternatim disposita, spathulato-oblonga, sæpius villosissima, exteriora minora, rarius bracteis 1–2 consimilibus donata. *Petala* 6, biseriata, oblonga, imo cuneata, lateribus medio utrinque auriculata, lobis introflexis, apice breviter bifida vel emarginata, lobis latis, obtusis. *Stamina* 6, petalis opposita et ad unguis affixa; *filamenta* imo dilatata et interdum villosa, superne teretia, tenuia et glabra, petalis æquilonga vel paulo excedentia; *antheræ* rotundiuscule 4-lobæ, sine connectivo 2-loculares, apice fere peltatim affixæ, subintrorsum flexæ, rima laterali utrinque 2-valvatim dehiscentes. *Ovaria* rudimentaria 3, punctiformia.—*Fœm. Sepala et petala* ut in masc. *Stamina* sterilia 6, circa gynæcium hirsutum affixa. *Ovaria* 3, gibba, gynæcio parvo insita, glabra, unilocularia, *ovulo* unico parieti interno appenso. *Stylus* nullus. *Stigma* excentricum, lineare, obtusum, horizontaliter deflexum, rugosum, sulco marginibus crenulatis superne signatum. *Drupæ* 3, vel abortu 1, subglobosæ, carnosulæ, circa basin stigmatem persistente notatæ: *putamen* reniformi-orbiculatum, trochiforme, paulo compressum, peripheria carina acuta sulcisque 2 notatum, faciebus radiatim tuberculato-liratis; *condylus* excentralis, utrinque meatu sæpissime amplo margine denticulato profunde vacuus et septo intermedio centro pertusus, hinc foraminibus 3 parallelis distinctis fere centralibus perforatum; 1-loculare, loculo quasi annulari circa condylum gyrato, in valvulas 2 facile solutum. *Semen* loculo conforme, fere annulare, extus convexum, intus subconcauum; *integumentum* tenue, ad latus internum laxum *chalaza* notatum, hinc intra lamina septi insinuatam et condylo affixam: *embryo* in *albumine* simplici carnosulo sepultus, cyclicus, *cotyledonibus* crassiuscule foliaceis, lineari-

oblongis, incumbentibus, *radicula* tereti supera ad stylum spectante 4-plo longioribus.

Frutices scandentes *Asia et Africa intertropica*; folia *petiolata, ovata, sæpius dense pubescentia, 3-5-nervia*; paniculæ ♂ *axillares, ramosæ, folio breviores, rarius longiores*; racemi ♀ *axillares, pauciflori*.

1. *Holopeira villosa*, nob. Ann. Nat. Hist. 2 ser. vii. 42;—*Cocculus villosus*, DC. Syst. i. 525, Prodr. i. 98; Hook. & Th. Fl. Ind. i. 193;—*Cocculus Aristolochiæ*, DC. Syst. i. 520, Prodr. i. 97; Pluk. Alm. t. 13. f. 2, p. 61, t. 384. f. 5;—*Menispermum villosum*, Lam. Dict. iv. 97; Roxb. Fl. Ind. iii. 812;—*Menispermum hirsutum*, Linn. Sp. 1469 (non Roxb.);—*Menispermum myosotoides*, Linn. Sp. 1469;—ramulis striatis, subglabris, junioribus tomentosis; foliis ovatis ellipticisve, imo subcordatis, rotundatis, obtusis aut subcuneatis, apice obtusis, emarginatis et mucronatis, e basi 5-nerviis, supra puberulis vel hirsutis, subtus dense cano vel cinereo tomentosis; petiolo pubescente, tereti, limbo 5-6-plo brevior: panicula ♂ axillari, pubescente, petiolum æquante, apice breviter 3-ramosa, ramis 3-floris, floribus breviter pedicellatis; sepalis 6, exterioribus angustioribus, 3 interioribus paulo longioribus, cuneato-ovatis, intus puberulis, extus longe pilosis; petalis 6, dimidio brevioribus, fuscis, cuneato-oblongis, apice breviter rotundato-bilobatis, lateribus auriculato-lobatis, lobis inflexis, lineis interruptis glandulosis pictis, extus longissime pilosis; staminibus 6, petalorum longitudine: panicula ♀ axillari, ♂ simili, sepalis et petalis ut in ♂, staminibus effœtis 6, dimidio brevioribus; ovariis 3, petalis æquilongis; stigmatibus tereti, crassiusculo, horizontaliter reflexo, apice leviter canaliculato.—In Indiæ peninsula: v. s. in herb. Soc. Linn., Madymangolam (Wall. Cat. 4957 A, G): in herb. Mus. Brit., Mangalore, Mysore (Buchanan): in herb. Hook., E. Ind. (Dr. Carey), Courtallam (H. & Th.); ♀, Bhorkurberee plains, Ganges (Dr. Thomson); ♀, Moostaphabad (Dr. Thomson), Delhi (Dr. Th. 34), Moorderabad, ♂ et ♀ (Dr. Thomson), N.W. India (Royle), ibidem ♀ (Royle).

A plant which seems abundantly distributed, and to vary in the form of its leaves, according to their age: the older ones are 3 inches long,  $1\frac{3}{4}$  inch broad near the base, with a basal sinus 1 line deep; the younger leaves are  $1\frac{1}{4}$  inch long, rounded at the base, forming a regular oblong oval. There is a specimen collected by Dr. Royle, probably in the Punjab, the leaves of which are almost lanceolate, tapering gradually from a rounded base to a narrow obtuse apex,  $1\frac{1}{4}$ – $1\frac{3}{4}$  inch long, 5–7 lines broad near the base, on petioles  $1\frac{1}{2}$ –2 lines long, all more or less pu-

bescent; but I can perceive no difference in the structure of the flowers. The panicles, both ♂ and ♀, are not more than 3 lines long in each axil; but as these approach the end of the branch, owing to the fall or deficiency of the leaves, the branch assumes the appearance of a long slender terminal raceme; the sepals are pubescent inside, thickly pilose outside; the petals are more than half their length, narrowly oblong, having a sharply cuneated base, with long, subobtuse, erect apical lobes, shortish inflected lateral lobes, and clothed outside, especially towards the base, with long, spreading, pilose hairs; they are somewhat thick and fuscous, marked with very dark lines, and are altogether very different from those of the following species. The putamen is pale yellow, crustaceous in texture, with a very thin, broad, laminated peripheric ridge, and a large open condyle, with broad apertures and a large hole in the middle of the thin lamina which separates its two hollow chambers.

2. *Holopeira laeviuscula*, nob. ;—*Menispermum hirsutum*, Roxb. (*non Linn.*) *Fl. Ind.* iii. 814;—*Cocculus sepium*, *Coleb. Linn. Trans.* xiii. 58, tab. 6. fig. 2;—ramulis tenuibus, scandentibus, cano pubescentibus; foliis oblongis, in adultis imo cordatis (in junioribus obtusis), e basi 5-nerviis, supra glabriusculis (in junioribus tomentosis), subtus cano vel flavido tomentosis; petiolo tenui, cano tomentoso, limbo 6-plo brevior: panicula ♂ axillari, brevissima, petiolum æquante, pauciflora; sepalis cuneato-oblongis, extus longe pilosis, intus glabris; petalis cuneato-ovatis et fere rhomboideis, lobis apicalibus late rotundatis, lateralibus perspicue auriculatis, inflexis, basalibus nullis, pallidis, omnino glabris; filamentis glabris: ♀ panicula simillima, sepalis et petalis marium, illis pilosis, his glaberrimis; ovariis 3, glabris, gynæcio piloso insitis.—In India orientali: *v. s. in herb. Soc. Linn.*, hort. Calc. cult. (Wall. Cat. 4957), *ibidem* (4957 B, C, D, E, F): *in herb. Mus. Brit.*, Ind. or. (König), (Wight, 42); ♂ (Roxb. sub *Men. hirsutum*): *in herb. Lemann.*, Aurungabad (Griffiths); Sumbuhlpoor (Griffiths): *in herb. Hook.*, Soane River (Hook. 208); ♂ et ♀, Concan (Law).

Roxburgh, in describing this species at full length, was right in keeping it distinct from his *Menispermum villosum*. Colebrook's description is *verbatim* that of Roxburgh's. There is little difference in the size and shape of the leaves; but in the flowers, both male and female, the petals are always paler, much shorter, broader, and nearly rhomboid, more transparent, marked with yellowish glands, the apical lobes broader and more obtuse; they are, besides, invariably destitute of hairs—a very marked distinction. The putamen is less crustaceous in texture, similar

in form; but the peripheric carina is not so sharp and prominent, and has on each side a deeper groove. The drupes are said to be of a blackish-purple colour; but the pulp has little solid matter in it. The leaves are  $2-2\frac{3}{4}$  inches long, with a basal sinus 2 lines deep,  $1\frac{1}{2}-2$  inches broad, on a petiole 4-5 lines long. The inner sepals are cuneately ovate, the two outer series oblong or almost linear; the petals are cuneately ovate, cordately and deeply emarginated between two rounded lobes at the apex, and with two distinct inflected lobes on the middle of the sides, quite glabrous and maculated by interrupted longitudinal lines.

3. *Holopeira auriculata*, nob. ;—ramulis tenuibus, flavido pubescentibus; foliis late ovatis, imo sinu levi paulo cordatis, angulis basalibus rotundis, mox in auriculis brevibus obtusis summum spectantibus productis, hinc subito angustatis et deltoideis, apice rotundiusculis, emarginatis et mucronulatis, e basi 5-nerviis, supra pubescentibus, subtus molliter cano vel griseo tomentosus (junioribus parvis, simpliciter ovatis aut subtrilobatis); petiolo tenui, griseo pubescente, limbo 5-plo brevior: inflorescentia ♀ in ramulis novellis axillaribus, foliis minoribus ovatis munitis; racemulo in axillulis solitario, brevi, simpliciter 1-2-3-floro, pubescente; floribus pedicellatis; sepalis 6, exterioribus cuneato-ovatis, interioribus longioribus, cuneato-oblongis, utrinque longe sericeo pilosis; petalis 6, sepalis æquilongis, imo ad medium cuneatis, apice latis et in 2 laciniis acute dentiformes profunde fassis, lateribus breviter auriculatis, obtusis et inflexis, superne glabris, extus ad unguem pilosis; staminibus sterilibus dimidio brevioribus, apice clavatis; ovariis 3, glabris; stigmatibus tereti, horizontaliter deflexo, superne crenulato-sulcato.—In India orientali: *v. s. in herb. Lemann.* (ex hort. bot. Calc. cult.).

A plant bearing a general resemblance to *Nephratica triloba*, but with differently shaped leaves, more sericeously pubescent, on much shorter petioles, and with flowers quite different. Its leaves are  $1\frac{3}{4}$  inch long, including the basal sinus 1 line deep; they are  $1\frac{1}{2}$  inch broad across the lateral lobes, which are separated by a narrow sinus from the middle lobe, which at its base is  $1\frac{1}{8}$  inch broad, diminishing upwards to the rounded summit, which is 3 lines broad; the lateral lobes extend 1 inch beyond the point of insertion of the petiole; the projecting apex 2 lines long and broad; the slender curving petiole is 4 lines long. The ♀ raceme is 4 lines long; the pedicels, bracteated at base, are  $\frac{1}{2}-1$  line long; the flower in bud is  $\frac{1}{2}$  line in diameter: the sepals, densely clothed with long hairs, are pale and membranaceous; the breadth of the petals across the lateral auricular lobes is equal to their entire length, they are cleft

at the apex for one-third of that length, suddenly cuneated at base, and clothed outside with long pilose hairs; the sterile stamens are slender, half the length of the petals; the three ovaries, seated on a raised gynæcium, are externally gibbous and glabrous; the style is suddenly deflected, obtuse and grooved.

4. *Holopeira torrida*, nob.;—ramulis scandentibus, teretibus, tenuibus, pubescentibus, junioribus tomentosis, demum nigrescentibus; foliis ovalibus aut oblongo-ovalibus, utrinque rotundiusculis, apice emarginatis et mucronulatis, submembranaceis, imo 5-nerviis, supra viridibus, opacis, subglabris aut puberulis, sulcato-reticulatis, subtus brunneo-glaucis aut griseo tomentosis, nervis prominulis, venis reticulatis immersis; petiolo tenui, pubescente, limbo 5–8-plo brevior: panicula ♀ axillari, petiolo vix longiore, aut sæpius e ramulo novello foliis plerumque deficientibus racemum elongatum mentiente, pubescente; pedunculo alternatim 3–4-ramoso; ramis brevibus, apice flores 3 subsessiles gerentibus; sepalis 6, ovatis, submembranaceis, pilosis; petalis 6, triplo brevioribus, cuneato-oblongis, apice late 2-dentatis, lateribus supra medium utrinque auriculatis, lobis brevibus inflexis, ungue basali piloso, undique lineis glandulosis pictis; staminibus sterilibus 6; ovariiis 3, glabris; stigmatate tereti, horizontaliter deflexo, supra canaliculato; drupis globosis, glabris; putamine crustaceo, compresso, condylo foraminibus 3 majusculis pertuso.—In Africa tropicali: *v. s. in herb. Hook.* ♀, Africa occidentali (Cunon); Shiré, Zambesi (Kirk).

This is a very distinct species, with extremely slender branches. The leaves are 1–2 inches long,  $\frac{1}{2}$ – $1\frac{1}{4}$  inch broad, on a petiole 1–2 lines long. The inflorescence is 3–6 lines long in the main axils, but shorter in those of the pseudo-racemes; the petals are cuneated at base for half their length, bidentate at the apex, with shortish, broadish, subdivaricated teeth, and smaller inflected lateral lobes, glabrous (with the exception of a few loose long hairs near the base). The putamen is extremely different from that of any of the preceding species; it is somewhat brittle and perforated by three large parallel holes.

5. *Holopeira lonchophylla*, nob.;—Cocculus Ferrandianus, *Seem. MS.*;—ramulis volubilibus, tenuibus, pubescentibus; foliis oblongis vel lanceolato-oblongis, imo obtusis aut cordatis, a medio gradatim acuminatis, e basi 3–5-nerviis, utrinque viridiconcoloribus, supra glabris, venis reticulatis nigris immersis, hinc quasi rugulosis, subtus in nervis tantum pubescentibus; petiolo subtenui, subpiloso, limbo 4-plo brevior: racemo ♀ axillari, pedunculo petiolo brevior, pedicellos 3 alternos 1-flores



apice gerente; sepalis 6, ovatis, 3 interioribus duplo majoribus, glabris, carnosis, marginibus membranaceis et ciliolatis; petalis 6, oblongis, fuscis, carnosulis, apice breviter divaricatim 2-dentatis, marginibus ad medium inflexis, lobis basalibus nullis; ovariis 6, glabris; putamine paulo compresso, trochleæformi, condylo subcentrali, 2-camerato, foraminibus 3 parvis perforato.—In insulis Sandwicensibus: *v. s. in herb. Hook.* ♀, Hue-hue (Hildebrandt, 135); Ohahu (Seemann, 2281).

The plants above noticed have both been referred to *Cocculus Ferrandianus*, but they do not accord with Gaudichaud's original species of that name, which belongs to the genus *Nephroica*; they differ not only in the form of the petals, but in the shape of the leaves, which are not lanceolate and acute at both extremities; in Dr. Seemann's specimen they are broadly obovate, and round at the base: they are 2–2 $\frac{3}{4}$  inches long,  $\frac{3}{4}$ –1 $\frac{1}{2}$  inch broad, on a petiole 6 lines long. The peduncle of the raceme is 3 lines, the pedicels 2 lines long; the drupes are fleshy; the putamen has a broad periphery, is rugosely scrobiculated on the surface, with two small external apertures in the condyle, the intermediate foramen being small but distinct, as in the three following species. This and the next species differ from all the preceding in having six ovaries, instead of three, in the ♀ flower.

6. *Holopeira fecunda*, nob.;—ramulis albido pubescentibus; foliis oblongo-ovatis, imo rotundatis, apice breviter et repente constrictis, acumine obtuso, mucronulato, e basi 5-nerviis, utrinque subnitentibus, in nervis venisque reticulatis puberulis, marginibus vix revolutis, subtus paulo pallidioribus; petiolo tenui, cinereo pubescente, limbo 4-plo brevior: racemis ♀ e pulvino piloso, supra-axillaribus, solitariis, petiolo sublongioribus, cinereo puberulis, 3–6-floris; pedicellis alternis, imo bracteolatis, pedunculo dimidio vel triplo brevioribus, floribus bractea donatis; sepalis 6, ovatis, submembranaceis, glabris, 3 interioribus paulo majoribus, glabris, 3 exterioribus interdum bracteaque margine ciliatis; petalis 6, dimidio brevioribus, submembranaceis, apice truncatis et obsolete 2-denticulatis, lobis lateralibus parvis, non inflexis; staminibus sterilibus 6, petalis dimidio brevioribus; ovariis 6, glabris; stylo brevi; stigmate longo, horizontaliter reflexo.—Patria ignota: *v. s. in herb. meo* (Hort. Kew. cult.).

This plant I collected many years ago in Kew Gardens; but how long it had grown there, or whence it came, no one could tell: it was probably introduced in the time of Ayton. The branches are slender, with axils 1–2 $\frac{1}{2}$  inches apart; the leaves

are 2-2½ inches long, 1¼-1½ inch broad: the rachis of the ♀ raceme is 3-5 lines long, the pedicels 1 line long, with their basal bracts puberulous; the floral bract is smaller than the sepals, all with ciliate margins; the petals, half the length of the glabrous sepals, are somewhat truncated at the apex, with a minute tooth at each angle, the interval between them being erose, and they have a small lateral lobe on each side a little below the middle, but not inflected. This and two others are the only species in the genus with six ovaries in the ♀ flower.

7. *Holopeira laurifolia*, nob.;—*Menispermum laurifolium*, *Roxb. Fl. Ind.* iii. 815;—*Cocculus laurifolius*, *DC. Syst.* i. 530, *Prodr.* i. 100; *Deless. Icon.* i. t. 97; *Coleb. Linn. Trans.* xiii. 65; *Hook. & Th. Fl. Ind.* i. 191;—erecta, ramulis dependens, subangulatis, striatis, glabris; foliis lanceolatis, utrinque attenuato-acutis, apice acutissimis et mucronatis, e basi 3-nerviis, nervis lateralibus margine parallelis et longe ultra medium productis, cum nervis alternis apicem versus utrinque 3, brevibus, divaricatis et arcuatim nexis, venisque plurimis transversim divaricatis et parallelis, valde reticulatis, marginibus cartilagineis subreflexis, utrinque nitidis et glaberrimis, subtus paulo pallidioribus, nervis prominulis, venis subimmersis; petiolo brevi, subtenui, infra carinato, supra canaliculato, glabro, limbo 12-plo brevior: paniculis ♂ racemosis, supra-axillaribus, folio brevioribus, solitariis, vel sæpius 2-3 fasciculatis, aut apice ramorum foliis abortis in thyrsum majusculum copiosiflorum productis; rachi striata, glabra; ramis subbrevis, alternis aut approximatis, imo fasciculo pilorum bracteolatis, apice 3-4-floris; floribus brevissime pedicellatis et corymbulosis; sepalis 9, submembranaceis, glabris, quorum 3 exteriora multo minora, bracteiformia, 3 interiora obovata, submembranacea, glabra, majora; petalis 6, squamiformibus, sepalis 5-plo brevioribus, cuneato-deltaideis, apice lobis 2 latis nonnihil divaricatis et introflexis emarginatis, lobis basalibus nullis; staminibus sepalis æquilongis, petalis 4-plo longioribus: racemis ♀ similibus; petalis subsquamiformibus, imo cuneatis, apice latiusculis et in lobos 2 rotundatos breviter fissis; staminibus effæctis petalis æquilongis, apice emarginatis; ovariiis 3, gibboso-ovatis, glabris, gynæcio elevato insitis, stylo longissimo, repente deflexo, supra late canaliculato; drupis 3, subglobosis pisi magnitudinis; putamine trochleæformi, peripheria subplano, condylo fere centrali 2-camerato, foraminibus 3 parallelis subparvis perforato.—In Himalaya subtropica: *v. s. in herb. Soc. Linn. et aliorum*, Nepal (Wall. Cat. 4965 A et C ♂, B ♀).

This species is described as an erect tree or shrub, with a

short trunk, its branches being pendulous and sometimes sarmentous. It is distinguished by its bright-green, polished, lanceolate leaves, which are noted for their three long principal nerves parallel with the margin and extending far towards the apex, where they anastomose with a few short nerves branching from the midrib. The leaves are 4–5½ inches long, 1–1½ inch broad, acute at both extremities, on a petiole 3–5 lines long, all quite glabrous. The panicles are very numerous, especially on the young branches, where they form a thyrse-like inflorescence; the flowers are small and glabrous.

8. *Holopeira Australis*, nob.;—*Menispermum Australe*, Zucc. MS.;—ramulis striatis, glabris, nigris; foliis oblongis, imo cuneatis, a medio sursum attenuatis, valde acutis, cuspidato-mucronatis, e basi 3-nerviis, nervis margini parallelis et ultra medium productis, lateralibus supra medium ortis, utrinque plurimis, divaricatis, mox inter se anastomosantibus, venis crebre transversis, valde reticulatis, marginibus cartilagineis valde reflexis, utrinque lucidis, pallide viridibus, concoloribus, glaberrimis, nervis venisque supra fere immersis, subtus crassioribus et prominentibus; petiolo glabro, sulcato-striato, superne canaliculato, limbo 10–15-plo brevior: panicula ♂ axillari, brevi, ramosa, petiolo 2-plo longiore; ramis paucis, alternis, brevibus, imo bracteolatis, apice flores 3 breviter pedicellatos gerentibus; sepalis 6, imo 2-bracteatis, ovatis, carnosis, marginibus membranaceis et pellucido punctatis; petalis 6, sepalis dimidio vel triplo brevioribus, subrhomboideis, imo cuneatis, ultra medium in dentes 4 majusculos profundiuscule incisus, dentibus subæqualibus, acute 3-angularibus, 2 intermediis erectis, lateralibus inflexis; staminibus 6, petalis 2-plo longioribus, filamentis compressis, submembranaceis.—In Java et Japonia: *v. s. in herb. Hook.* ♂, Java (Lobb), Java (Horsfield, 245), Japonia (De Vriesse): *in herb. DeCand.* ♂ (Zollinger, 1640), ♀ (Zollinger, 3184): *in herb. Lindley.* ♂, Japonia? (Siebold). (Anno 1840, in hort. Monach. cult. sub nom. a Zuccarini impositum “*Menispermum Australe.*”)

The last-mentioned specimen appears to have been cultivated in Munich, from a plant brought from Japan by Siebold; and with this I find the dried specimens from Java quite correspond. Though much resembling the preceding Nepal species in general appearance, it differs in having much broader, more coriaceous leaves, and a much shorter inflorescence, in which the flower is somewhat larger; its sepals are ovate, fleshy, and pellucid-punctate; and its petals are somewhat angularly 4-lobed at the summit, the lateral lobes being inflected, and they are quite de-

ficient of the basal auricular lobes existing in *Nepthroica*. Its leaves are  $2\frac{1}{2}$ – $4\frac{1}{4}$  inches long, 13–17 lines broad, on a petiole 3 lines long. The ♂ panicle is 3–6 lines long; the rachis is somewhat slender, striated, glabrous; its alternate branches, 1 line long, are also glabrous, the bracteoles alone being pilose; the pedicels 1 line long.

9. *Holopeira fusiformis*, nob.;—ramis strictis, foliis late fusiformi-oblongis, utrinque valde acutis, apicem versus constrictis et breviter acute acuminatis, e basi 3-nerviis, nervis ultra medium margini parallelis cum nervis alteris paucis e costa divergentibus inter se curvatim nexis, venis transversim parallelis, valde reticulatis, utrinque glaberrimis, supra lucidulis; petiolo brevi, glabro, limbo 12-plo brevior: panicula ♂ axillari, puberula, petiolo æquilonga, ramosa; ramis imo bracteolatis, flores 3 pedicellatos bracteolatos gerentibus; floribus glabris; sepalis 9, ruguloso-bullatis, extus gradatim minoribus, exterioribus bracteiformibus, 3 interioribus orbiculatis, subplanis, carnosis, margine membranaceis et pellucido punctatis; petalis 6, minimis, 6-plo brevioribus, carnosulis, cuneato-oblongis, apice profunde emarginatis aut obtuse sub-2-lobis, concavis, lobis basalibus nullis; staminibus 6, petalis subamplexis et paulo longioribus: paniculis ♀ petiolo æquilongis; sepalis petalisque marium similibus; staminibus sterilibus 6, brevibus; ovarii 3, gynæcio stipitato insitis, gibboso-ovatis; stylo ovarii fere longitudine, latiusculo, profunde canaliculato, subito reflexo et curvato.—In Java: *v. s. in herb. Mus. Brit.* (Horsfield).

This species, with much the character of the two preceding, has its leaves still broader, and is distinguished from both by the minute size, and especially by the shape, of its petals. Its leaves are 4– $4\frac{1}{2}$  inches long,  $1\frac{3}{4}$ – $1\frac{7}{8}$  inch broad, on a petiole 3–4 lines long. The ♂ panicle is 6 lines long, with about six alternate very short branches, less than a line in length, and each bearing three nearly sessile flowers on its apex: the ♀ panicles are of the same length, with the same number of branches and flowers.

### 37. DIPLOCLISIA.

This genus was proposed by me, in 1851, for a small set of plants of which the *Cocculus macrocarpus*, W. & A., is the type. It differs from *Cocculus*, *Nepthroica*, and *Holopeira* in habit and the structure of its putamen and seed. These differences are so manifest that it is difficult to conceive how it was possible that such experienced botanists as the authors of the 'Flora Indica'

and the 'Genera Plantarum' should refuse to acknowledge *Diplochisia*, and why they have merged it, together with *Nephroica* and *Holopeira*, into *Cocculus*. In its habit there is nothing resembling a single species of either of those genera; for the typical plant bears much the appearance of *Chondodendron tomentosum* of the 'Flora Peruviana,' agreeing in its distant, nearly orbicular, large leaves, with crenately sinuated margins, supported upon very elongated slender petioles, the nerves as well as their branches terminating in the crenatures of the margin, and not anastomosing as in all the genera before mentioned. The ♂ inflorescence is racemose, long and slender, with short branches bearing from one to three pedicellated flowers; the ♀ raceme is still more elongated, quite simple, with extremely lengthened pedicels; the sepals are ovate and prettily maculated; the petals cuneately rhomboid, with the lateral angles inflexed; the filaments are much thickened and incurved at the apex, in which is dorsally imbedded a 2-celled anther, which bursts bivalvately by a horizontal fissure: the ♀ flower has six sterile stamens, a glabrous ovary, with a short thick style, surmounted by a horizontally reflected, one-lipped, narrowly cup-shaped stigma with a very crenulated margin. The drupe is oblong, in one species being unusually large; its putamen, like that of *Tiliacora* and *Chondodendron*, is oblong, greatly compressed, of coriaceous texture, with a carinal periphery and a prominent, radiately striated, horseshoe-shaped ring upon the outer edge of each face, leaving a somewhat falcate very deep depression extending from the base to beyond the centre, with a prominent narrow rib down its middle; its condyle is internal, in the form of a linear septum connecting the two opposite hollows in the line of the projecting ribs; thus it divides the cell nearly into two pouches, giving it the form of a horseshoe with its long legs almost parallel: the seed is therefore hippocrepiform, not cyclical as in the other genera before mentioned; the embryo, imbedded in fleshy albumen, partakes of the same form, has linear, strap-shaped, very long, flattened, incumbent cotyledons; but the radicle is extremely short, somewhat conical, a third or a fourth of their breadth, and is in one species only one-eighteenth, in another one-twelfth part of their incurved length. But it is not alone in these extremely dissimilar floral and seminal characters that this incompatibility exists: *Diplochisia* partakes of the rule which prevails throughout the *Menispermaceæ*—that where such differences exist, we may rely on finding a corresponding diversity in the habit of the plants of the genus. These combined circumstances fully justify a strong protest against the attempt to confound *Diplochisia* with *Cocculus*, *Nephroica*, and *Holopeira*.

DIPLOCLISIA, nob. ;—*Flores* dioici. *Masc.* *Sepala* 6, biserialia, interiora alterna, duplo majora, cuneato-ovata, subconca, sæpissime lineis parallelis interruptis maculatim picta, æstivatione imbricata. *Petala* 6, dimidio minora, cuneato-rhomboidæ, apice obtusiuscula, lobis lateralibus obtusis et involutis, guttatim picta. *Stamina* 6, petalis opposita et paululo longiora; *filamenta* imo tenuiora, superne latiora et valde incrassata, intus plana, extus convexa, carnosula, guttatim picta, apice gradatim inflexa; *antheræ* subglobosæ, sub-4-lobæ, summo filamentorum dorsaliter subimmersæ, introrsæ, 2-loculares, loculis parallelim adnatis, rima transversa 2-valvulim hiantibus. *Ovaria rudimentaria* 3, centralia, punctiformia.—*Fœm.* *Sepala* et *petala* masc. *Stamina sterilia* 6, petalis æquilonga, imo gynæcii orta, compresso-filiformia, extus convexiora, subincurva, glandulis 2 ovalibus apice notata. *Ovaria* 3, gibboso-oblonga, glabra, gynæcio conico trigono insita, erecta, 1-locularia, *ovulo* unico, lateri interiori appenso. *Stylus* validus, teres, angulo interno excentricus et erectus. *Stigma* horizontaliter expansum, extus subunilabiatum vel cymbiforme, valde concavum, marginibus crenatoplicatis. *Drupæ* 3, vel abortu 1, magnæ, obovato-oblongæ, sarcocarpio parvo viscido, stylo persistente basi contiguo notatum. *Putamen* majusculum, longe obovatum, valde compressum, subincurvum, circa peripheriam carinatam rugis irregularibus radiatim sulcatum, utraque facie lacuna longitudinali imo angustiore incurva excavatum, et hic linea prominente liratum, 1-loculare; *condylus* internus, angustissime septiformis, liras externas adversus, a basi ultra medium loculi protensus, loculo hoc modo longiuscule bimarsupiato et hippocrepiformi. *Semen* loculo conforme, transverse crenulatum; *integumentum* membranaceum, raphe lineari chalazaque ventrali ad condylum affixum: *embryo* hippocrepicus, intra albumen simplex subparcum sepultus, *cotyledonibus* late linearibus, foliaceis, carnosulis, incumbentibus, *radicula* brevissima tereti supera ad stylum spectante multiplo longioribus.

Frutices volubiles *Indiæ orientalis*, ramulis longissimis, dependentibus; folia palata vel subpeltata, suborbicularia vel late subdeltoidea, vix cordata, marginibus cartilagineis et subcrenatis, glaberrima, 5-nervia, nervis externe ramosis, ramisque in crenaturis marginalibus terminantibus, subtus sæpe cretaceo-glaucis, longissime petiolata; racemi sæpissime graciles, valde elongati, in axillis solitarii vel plurimi, e cicatricibus post foliorum delapsum, fasciculati, penduli, et cum floribus omnino glabri.

1. *Diploclisia macrocarpa*, nob. in Ann. Nat. Hist. 2 ser. vii. 42; —*Cocculus macrocarpus*, *Wight, Ill.* i. 22, tab. 7; *W. & Arn.*

*Pr. Fl. Ind.* i. 13:—ramulis teretibus, flexuosis, nodis approximatis; foliis rhomboideo-orbiculatis, imo fere cuneatis, apice obtusiusculis, margine integro, e basi 5-nerviis, utrinque glabris, subtus pallidioribus, nervis flavidis prominulis; petiolo tereti, limbo dimidio brevior, palatim inserto: panicula ♂ axillari, petiolo paulo longiore, a basi ramosa; ramis alternis, imo bracteolatis, rachi 2-4-plo brevioribus, alternatim 3-5-floris; floribus pedicellatis: racemo ♀ fructifero, folio 3-4-plo longiore, laxo ramoso, ramis alternis aut oppositis, longiusculis, parce ramulosis, ramulis 1-3-floris; drupis majusculis.—In Malabaria et China: *v. s. in herb. Mus. Brit. et Hook.* ♀ sine foliis et sine loco (Wight, 41); ♀, China (Seemann, 2459).

Judging from the drawing above quoted, this species is very distinct from any of the following, differing in the shape of its leaves, their much shorter petioles, and the comparatively extreme brevity of the ♂ panicles. The analysis shown of the structure of its flowers agrees well with those of the other species which I have examined. Dr. Wight, at the time of the publication of his works, seems to have preserved no specimens of the ♂ plant, and only fruit-bearing specimens of the ♀ plant, which are all without leaves; and these, as far as possible, demonstrate the accuracy of the drawing. The 'Illustrations,' printed at Madras in 1834, give no diagnosis of the species, nor a word of description in explanation of the plate 7, either in regard to the leaves or inflorescence; and the 'Prodromus,' published in London in the same year, makes no mention of any of its features, because no leaf-bearing or flowering specimens had then been seen by Dr. Arnott, who merely stated all that the specimens could show, viz. that the fructiferous raceme is "compound, lax, with opposite pedicels, its length being from 8 to 12 inches, and the drupe fully an inch long." No specimen of this plant has since been collected; but this circumstance cannot negative the proof of its existence, as no botanist can doubt the universal truthfulness of the drawings of the 'Illustrations' as well as the 'Icones' of Dr. Wight. The plate above quoted shows that in this species the axils are about  $\frac{3}{4}$  inch apart, the leaves  $2\frac{1}{2}$ - $2\frac{3}{4}$  inches long,  $2\frac{1}{2}$ - $2\frac{3}{4}$  inches broad, on a curving petiole  $1\frac{1}{4}$  inch long: the ♂ panicle appears to be  $1\frac{1}{2}$ -2 inches long, with from three to five branches (including the basal one  $\frac{3}{4}$  inch long), which diminish upwards, each bearing from three to five flowers on rather long pedicels, all the articulations being provided with a minute bract. The fructiferous raceme is from 8 to 12 inches long; its basal divaricating branch is  $2\frac{1}{2}$  inches long, the others diminishing upwards;

their very spreading branchlets are  $\frac{1}{4}$ – $\frac{1}{2}$  inch long, bearing one or two pedicels of the same length, globosely enlarged at their summit and supporting from one to three drupes 1 inch long and  $\frac{3}{4}$  inch broad (which is larger than the fruit of any of the following species).

In Dr. Seemann's collection from China there is a plant which singularly corresponds with Dr. Wight's drawing, especially in the shape of its leaves and their equally short petiole; its leaves are of the same size, similar in shape, subrhomboid, subcuneate at base, 5-nerved, entire on the margin, subcoriaceous, smooth and pale green above, greenish glaucous beneath, with prominent yellow nerves,  $2\frac{3}{4}$  inches long,  $2\frac{3}{4}$  inches broad, with a petiole palately inserted,  $1\frac{5}{8}$ – $1\frac{3}{4}$  inch long: the ♀ fructiferous raceme, quite immature, is 12 inches long, on a rather stout rachis, with divaricating branches  $\frac{1}{2}$ – $\frac{3}{4}$  inch apart,  $\frac{1}{4}$  inch long, bearing one or two fructiferous pedicels  $\frac{1}{4}$  inch long, thus agreeing with Dr. Wight's drawing and conforming to the characters stated in the above diagnosis. There is some resemblance in the shape of the leaves and mode of insertion of the petiole to *D. pictinervis*; but there the leaves are much thinner in texture, whitish beneath, with violet-coloured nerves, and they have a much longer and a more slender petiole.

2. *Diploclisia inchyta*, nob.;—*Cocculus macrocarpus*, *Hook. et Th. in parte (non Wight nec W. et Arn.) Fl. Ind.* i. 191;—*Quinio cocculoides*, *Schlecht. Linnæa*, xxvi. p. 732;—ramulis teretibus, strictiusculis, striatis, nitidis, nigris; axillis valde approximatis et ob foliis deciduis mox cupuloso-nodosis; foliis late orbicularibus, imo cordatis vel subtruncatis, a medio gradatim subangustioribus, apice rotundiusculis et emarginatis, ad nervum marginalem cartilagineum prominulum remote sinuato-crenatis, e basi 5-nerviis, nervis extus longe ramosis, ramisque in sinibus marginalibus terminantibus, utrinque glaberrimis, transversim venosis, supra nitentibus viridibus, subtus opacis canescenti-vel fulvido-glaucis, nervis tenuibus prominulis; petiolo gracili, recto, rigidulo, striato, glabro, imo vix incrassato, apice fuscule, plus minusve intra marginem inserto, limbo fere duplo longiore: panicula ♂ elongata, in ramis junioribus axillari et solitaria, a basi sursum alternatim ramosa; vel in ramis annotinis aphyllis plurimæ, similes, longissimæ, glabræ; rachi ramosa; ramis longiusculis, valde divaricatis, ramulos 2–3 unifloros apice gerentibus; floribus pedicellatis: paniculis ♀ similibus, sed cum ramis longioribus; drupis quam in præcedente multo minoribus.—In Malabaria et Zeylania: *v. s. in herb. meo* ♂, Peradenia, Ceylon (Gardn. 29): *in herb. Hook.* ♂, Courtallam (Wight,



27); ♀, in fructu, penins. Ind. (Wight); ♂ et ♀, Ceylon (Thwaites, 1052); Bombay (Law), Concan (Gibson), Mangalore (Hohenacker, 836).

This species is extremely distinct from the preceding, differing in its larger, rounder, broader, more deeply crenated, subcordate leaves with straighter nervures, upon very much longer and straighter petioles, in its far longer and more slender ♂ panicles with smaller flowers. Gardner informed me that the stem of this climbing plant attains the size of more than a foot in diameter, exhibiting in its cross section very numerous concentric zones. Its leaves, when full-grown, are 3 inches long,  $3\frac{1}{4}$  inches broad, on a very slender rigid petiole 5 inches long. The ♂ panicles grow out of the axils of the younger branches whose leaves have not attained more than an inch in diameter; the rachis is very slender, 4-5 inches long, with branches about  $\frac{1}{2}$  inch apart and  $\frac{1}{2}$ -1 inch long, filiform, spicately charged with from four to ten one-flowered pedicels; the flower expanded does not exceed 1 line in diameter. The panicles out of the old leafless nodes measure sometimes 14 inches in length, and are branched in a similar manner. The ♀ fructiferous panicle sent from the Indian peninsula by Dr. Wight is 5 inches long, with slender branches 1-1 $\frac{1}{2}$  inch long, and a fruit only 7 lines long and 5 lines broad, of a glaucous hue, thus differing from that of the preceding species, in which the rachis is twice its length, with very stout branches 2 inches long, and with drupes nearly double their size.

The above fructiferous specimen and the ♂ flowering specimens sent from Courtallam by Dr. Wight must have reached England after the publication of the 'Illustrations' and the 'Prodromus;' for upon them is a note in Dr. Arnott's writing, which says:—"In all the specimens sent me by Wight the ♂ flowers are in an elongated narrow panicle, as you see here, and come out seven panicles together from the old leafless branches; but in Wight's 'Illustrations,' pl. 7, they are figured differently." This amply confirms the inferences I have drawn regarding the preceding species. Dr. Wight has informed me that he cannot now call to mind any recollection of this difference.

Under a separate head I will at a future time recapitulate the characters upon which Schlechtendal founded his genus *Quinio*, and will show that it was established upon the plant above quoted, collected in Mangalore by Hohenacker. His *Quinio cocculoides* will therefore become a synonym of *Diplochisia inclyta*.

Var. *peltoides*: v. s. in herb. Hook., Bombay (Law). This variety is remarkable for its more deeply peltate leaves, cordate

at base, 7-9-nerved, 3-3½ inches long, 3¾ inches broad, with a very shallow basal sinus, the petiole being 4 inches long, inserted 3 lines within the margin of that sinus: its ♂ racemose panicle, with short corymbulose branches, is 9-11 inches long.

3. *Diploclisia lepida*, nob.;—ramulis rubicundis, striatellis, axillis subnodosis, remotiusculis; foliis subpalatis, late reniformibus aut deltoideo-orbiculatis, imo subcordatis vel truncatis et leviter bisinuatis, ultra medium paulo angustioribus, apice rotundato-obtusis, emarginatis et mucronatis, in nervo marginali fulvo integris aut obsolete crenatis, e basi quintuplenniis, utrinque glaberrimis, supra læte viridibus, subnitidis, lævibus, nervis venisque omnino immersis, subtus glaucis, nervis venisque reticulatis paulo prominulis aut subimmersis; petiolo tenui, subito deflexo, limbum vix æquante aut brevioris; floribus ignotis.—In regione Malayana et Khasyana: *v. s. in herb. Hook.*, Chittagong (Griffiths), ibidem (Hook. & Th.), Amherst, Tenasserim (Falconer), Churra, Khasya (Hook. & Th.).

This species differs in its comparatively broader leaves, which are wider than long, and fixed upon a petiole shorter than the limb, in which respect it offers a striking contrast with the preceding species and approaches *D. macrocarpa*. The axils are 1½-2 inches apart; the leaves are 2½-3½ inches long, 3-4½ inches broad, on a petiole 1¾-2½ inches long.

4. *Diploclisia pictinervis*, nob.;—ramulis teneribus, teretibus, crebre striolatis, glabris; foliis palatis, rhombico-orbicularibus, imo obtusis aut breviter constrictis et cuneate bisinuatis, ultra medium gradatim angustioribus, apice acutiusculis, e basi 5-7-nerviis, nervis rectiuscule digitatis, extus ramosis, ramisque in nervum marginalem crenatum terminantibus, utrinque glaberrimis, supra læte viridibus, opacis, subtus cretacee vel luride opacis, nervis tenuibus venisque transversis violaceis; petiolo tenuissimo, limbo paulo longiore, apice fusculo: racemo ♂ longissimo, pendulino, axillari; rachi tenui, striata, glabra, petiolo 5-plo longiore; ramis brevibus, plerumque geminis, flores plurimos alternatim pedicellatos crebriter corymbulosos gerentibus.—In India: *v. s. in herb. Mus. Brit.* ♂, Ind. or. (Soc. Unit. Fratr.).

This differs from the two preceding species in the rhomboidal form of its flaccid leaves, which are of thinner texture, with violet-coloured nervures and a slender limp petiole. The leaves are 2¼-3¼ inches long, 2¼-3 inches broad, on a petiole 2-2¾ inches long. The ♂ raceme is 12-16 inches long, on a very slender straight rachis, with branches often geminate, at intervals of ¼-½ inch apart, of nearly equal length throughout, and about

6 lines long, terminating in a head of closely approximated rays, each bearing two pedicellated flowers; these are darkish,  $2\frac{1}{2}$  lines in diameter when expanded.

### 38. TRISTICHOCALYX.

This genus has been established by Dr. Mueller, upon sufficiently valid grounds, for an Australian plant which had been referred to *Pachygone* by Mr. Bentham; but the structure of its seed shows that it belongs to a different tribe (the *Platygoneæ*), its station being near *Cocculus*. Dr. Mueller considered that its place was close to *Tinomiscium*: but it does not bear the slightest analogy with that genus; in habit it resembles some species of *Limacia*. Dr. Mueller's description of the fruit and seed is not as clear as might be desired; but if I understand it rightly, the embryo is imbedded in copious simple albumen, has a superior short terete radicle, with somewhat large, oval, thin, foliaceous cotyledons, which are incumbently curved, with one face directed to the condyle, as in *Cocculus*; at least, that is what I understand by his expression "cotyledones latæ, tennerrime membranaceæ, sibi applicitæ." There is a seed of this plant in the Hookerian herbarium, which has been broken into fragments in the attempt to analyze it: there we find some portions of the albumen, which is of a solid waxy consistence; the radicle is terete, attached to half of one of the cotyledons, the other one being deficient. From this and the broken putamen, assisted by Dr. Mueller's details, I have drawn up the following generic character.

I may take this opportunity of recommending any botanist desirous of analyzing any Menispermaceous seed to adopt the method I have always successfully followed—after macerating and freeing the putamen from its pericarpial covering, to introduce the point of the dissecting-knife along the peripheral line of suture, when it is easily separated into two valves, leaving the kernel in an entire state: we thus see the true form of the cell, its position with regard to the condyle, and the mode of attachment of the seed, the embryo and the albumen, if present, being thus obtained whole and uninjured.

In the herbarium of the late Dr. Lindley, I found an Australian plant, collected in Capt. Mitchel's exploring expedition, which may be considered a second species of this genus: this has enabled me to render the generic character more complete.

TRISTICHOCALYX, F. Muell.—*Flores* dioici. *Masc. Sepala* 9, 3-serialia, extus alternatim minora, exteriora lanceolata, in-

teriora elliptica, subacuta, æstivatione imbricata. *Petala* 6, sepalis dimidio breviora, imo cuneata, rotundatim sub-3-loba, lobis lateralibus, involutis, stamina cingentia. *Stamina* 6, libera, petalis opposita et æquilonga; *filamenta* teretia, apice incrassata; *antheræ* dorso introrsum affixæ, subglobosæ, sub-4-lobæ, 2-loculares, loculis sine connectivo collateralibus, rima transversa dehiscentibus.—*Fœm.* nondum cogniti. *Drupa* (reliquis abortivis?) solitaria, gibboso-ovata, exsicca; *putamen* reniformi-subglobosum, paulo compressum, subosseum, 1-loculare, latere ventrali *condylo* interno paulo intruso notatum. *Semen* nephroideum: *embryo* in *albumine* copioso cereaceo albido immersus, subincurvus, *cotyledonibus* ovatis, tenerime foliaceis, incumbentibus, *radicula* brevi tereti supera ad stylum subbasalem spectante multo longioribus.

Frutices *Australasici volubiles*; folia *elliptica, acuta, petiolata, 3-5-nervia, crassiuscula, supra nitentia, subtus pubescentia*: paniculæ ♂ *axillares, solitariae vel geminae, folio breviores, puberulae*; flores *parvi, pedicellati*.

1. *Tristichocalyx pubescens*, F. Mueller, Fragm. iv. 27;—*Pachygone pubescens*, Benth. *Fl. Austr.* i. 58;—ramulis teretibus, striatis, pubescentibus; foliis ellipticis aut late ovatis, imo vix acutis aut bisinuato-obtusis, apice breviter acuminatis, e basi 5-nerviis, nervis extus ramosis, cum alteris lateralibus anastomosantibus, subcoriaceis, valde convexis, supra pallidis, opacis, glabris, lævibus vel scabriusculis, nervis fere immersis, costa media puberula, subtus pallidioribus, pilis brevissimis tomentoso-puberulis, nervis venisque reticulatis, prominulis, marginibus cartilagineis subrevolutis; petiolo subtenui, apice tumidulo et pubescente, limbo 5-plo brevior: paniculis ♂ racemosis, axillaribus, 2-3, fasciculatis, folio brevioribus, pubescentibus, subspicatis; ramulis brevissimis, fere a basi alternatim 2-4, fasciculatis, subapproximatis, bracteolatis; sepalis glabris; petalis iis dimidio brevioribus, stamina amplectentibus.—In Australasia boreali-orientali: *v. s. in herb. Hook.*, Quail Island (Flood).

The axils are  $\frac{1}{2}$ – $\frac{3}{4}$  inch apart; the leaves are 4–4 $\frac{3}{4}$  inches long, 2 $\frac{1}{4}$ –2 $\frac{1}{2}$  inches broad, on a petiole about 1 inch long; the racemiform panicle is about 2 $\frac{1}{2}$  inches long, its fascicles 2-3 lines apart, the pedicels about 1 line long, the expanded flower 1 line in diameter; the putamen is 3 lines in diameter; the septiform condyle intrudes scarcely more than half a line into the cavity of the cell; the seed and embryo, therefore, must be little curved.

2. *Tristichocalyx diffusus*, nob.;—ramulis scandentibus, flexuosis,

tenuibus, teretibus, ferrugineo tomentosis; foliis ellipticis, imo cuneatim acutis, apice acumine brevi acuto vel obtusulo attenuatis, e basi 5-nerviis, nervis extus ramosis, ramis arcuatim nexis, crassiusculis, supra nitidis, reticulatis, in nervis tantum puberulis, subtus cano-glaucis, molliter puberulis, marginibus revolutis et tomentellis; petiolo tenui, pubescente, limbo triplo brevior: paniculis ♂ axillaribus, solitariis vel geminis, laxe ramosis, corymbosis, trichotome divisis, tomentosis; floribus pedicellatis; sepalis 9, rotatis, 3 exterioribus lanceolatis, dimidio brevioribus, 3 intermediis lanceolato-oblongis, acutis, 3 interioribus ellipticis, istis æquilongis sed duplo latioribus, cunctis intus paulo, extus densius longe pubescentibus, ciliatis; petalis 6, sepalis interioribus triplo brevioribus, glabris, cuneato-subtrilobis, lobis rotundatis, lateralibus involutis; staminibus 6, petala paulo excedentibus. —In Australasia interiore: *v. s. in herb. Lindl.* (Mitchel).

This plant was collected in the "interior of New Holland" in 1836 by the Expedition under Major Mitchel. The branches are slender, with axils  $\frac{1}{2}$ –1 inch apart; the leaves are 2 inches long,  $1\frac{1}{8}$  inch broad, on a petiole 8 lines long; the panicle is  $1-1\frac{1}{4}$  inch long, 1 inch broad, with close alternate branches, and short secondary branchlets, each bearing about three alternate pedicellated flowers; the pedicels are  $1\frac{1}{2}$  line long, the expanded flower 2 lines in diameter.

### 39. LEGNEPHORA.

The type of this genus is a plant from Australia, the *Cocculus Moorii* of Dr. Mueller, which Messrs. Bentham and Hooker referred to a well-known Indian species, *Pericampylus incanus*; and in my description of that species I have alluded to the great discrepancies existing between them. It differs from that genus in its glanduliferous, cuneate, orbicular petals, in its free stamens in the ♂ flower, and in the want of petals, in its peculiar sterile stamens, and a different stigma in the ♀ flower, and in the widely different form of the putamen and structure of the seed. The leaves are broadly ovate, often cordate at base with five straight basal nerves reaching nearly to the apex and much branched externally, polished and reticulated above, glauco-pruinose beneath, on a pubescent petiole more than half their length. The ♂ axillary panicle is about the length of the petiole, with somewhat verticillate branches: the ♀ inflorescence is much shorter, with a bifurcate peduncle, each branch bearing about three alternate pedicellated flowers: the ♂ flower has six sepals, six petals, and six free stamens: the ♀ flower has six sepals, no pe-

tals, six sterile stamens opposite the sepals, the filament being much compressed and dilated considerably towards the apex, which is truncated, bearing a cup-shaped gland immersed in each angle: the putamen is cuneately orbicular, greatly compressed, with an excentral, concave, scutiform impression; around the hipocrepiform cell it has a very broad wing, formed of five flat plates (one peripheral, two lateral on each side), cleft into pergamineous or soft teeth, somewhat imbricated and radiating in a direction parallel with the faces, and from which the meso-carpal pulp, in which they are imbedded, is with difficulty separated\*. I have not seen a perfect seed; but Dr. Mueller states (Fl. Austral. i. 56) that the embryo is in the axis of the albumen, with narrow cotyledons closed against each other—a definition scarcely comprehensible; but, as he refers his plant to *Cocculus*, we may interpret his meaning to be that the embryo has incumbent cotyledons imbedded in albumen, as in that genus; and on this evidence I have placed *Legnephora* among the *Platygoneæ*, after *Tristichocalyx*.

LEGENPHORA, nob.—*Flores* dioici. *Masc.* *Sepala* 6, biseriata, subæqualia, elliptica, vix acuta, extus pilosa, 3 exteriora paulo angustiora, æstivatione imbricata. *Petala* 6, squamiformia, sepalis opposita et 6-plo breviora, cuneato-rotundata, lateribus glanduloso-incrassatis, glabra, carnosula. *Stamina* 6, petalis æquilonga et opposita; *filamenta* teretia, sursum gradatim incrassata; *antheræ* subglobosæ, filamento duplo latiores, dorso affixæ, introrsæ, 2-loculares, loculis connectivo angusto paululo excurrente sejunctis, utrinque rima transversali 2-valvatim dehiscentibus.—*Fœm.* *Sepala* ut in masc. *Petala* nulla. *Stamina sterilia* 6, sepalis opposita et duplo breviora, cuneato-linearia, apice dilatata et truncata, subcanaliculata, cum glandula concava in quoque angulo semiimmersa. *Ovaria* 3, gibboso-globosa, pilosula, 1-locularia, 1-ovulata. *Stylus* brevissimus aut obsoletus. *Stigma* cordato-orbiculatum, concavum, indivisum, horizontaliter reflexum. *Drupæ* 3, vel abortu pauciores, compresso-globosæ, carnosæ, stigmatibus basin versus notatæ: *putamen* cuneato-orbiculare, valde compressum, tenuiter osseum, utraque facie carina hipocrepiformi prominula circa excavationem excentricam obovatam scutiformem signatum, carina marginali latissima, e laminis pergamineis 5 (quarum 1 peripherica, et utrinque laterales 2) profunde fimbriatim incisus, laciniis irregularibus, parallele radiantibus et ad pulpam carnosam arcte adhærentibus, 1-loculare; loculo hipocrepico aut subcyclico; *condylus* omnino internus,

\* Hence the generic name, from λέγνη (*fimbria*), φέρω (*fero*).

scuto externo multo brevior, vacuus, clausus. *Semen* (vix maturum visum): *integumentum* loculum implens, membranaceum, medio ad latus internum *chalaza* notatum et hinc intra condylum insinuatum: *embryo cotyledonibus* lineari-oblongis in *albumine* sepultus.

*Frutex Australiæ orientalis, scandens; folia petiolata, ovata, e basi 5-7-nervia, supra glabra, nitida, subtus glauco-pruinosa; panicula ♂ axillaris, tomentosa: racemus ♀ axillaris et terminalis, sub-6-florus; drupæ glabræ.*

*Legnephora Moorii*, nob.;—*Cocculus Moorii*, *F. Mueller, Fragm.* i. 162;—*Pericampylus incanus*, *Benth. (non nob.) Fl. Austral.* i. 58;—ramulis teretibus, striatis, ad nodos compressis, puberulis; foliis ovatis, imo obtusissimis vel truncatis, ultra medium curvatim angustatis, apice acute mucronatis, marginibus crispato-undulatis, e basi 5-7-nerviis, rigidulis, valde reticulatis, supra nitentibus, subtus flavido vel albido pruinosis aut sordide glaucis, in nervis venisque prominulis sæpe puberulis; petiolo tenui, puberulo, limbo brevior: panicula ♂ axillari, tomentosa, petiolo longiore, alternatim ramosa; ramis sæpe 2-4, verticillatis, apice trichotome divisis, ramulis corymbulosis, paucifloris; sepalis ellipticis, utrinque puberulis: racemo ♀ axillari vel terminali, paucifloro; drupis subglobosis, glabris.—In Australia: *v. s. in herb. Hook.* ♂, Wide Bay, Queensland (Oldfield), Macarthur (Backhouse); ♀, Burnett River (Mueller).

This is a plant possessing much of the habit of *Diploclisia*: its leaves are  $2\frac{1}{2}$ – $4\frac{1}{4}$  inches long, 2–4 inches broad, on a petiole 2–3 inches long. Backhouse states that the leaves often measure  $5\frac{1}{2}$  inches long,  $5\frac{1}{2}$  inches broad, the floral leaves being usually  $2\frac{1}{2}$  inches long, 2 inches wide. The ♂ raceme is about  $1\frac{1}{2}$  inch long, its primary branches are 3 lines long, the secondary branchlets 2 lines long; the flowers, on very short pedicels, are  $2\frac{1}{2}$  lines in diameter when expanded; the petals are one-fourth the length of the sepals, cuneate at base, hatchet-shaped, flat, with glandularly thickened sides; stamens as long as the petals, and fixed to their claws, all rotately expanded. In the ♀ flower the sepals are similar to those of the ♂; no petals, six sterile stamens half their length, and three free pilose ovaries, forming a globular mass in the centre.

#### 40. SARCOPETALUM.

This genus was established by Dr. Mueller in his 'Flora of Victoria' (p. 26, tab. suppl. 3), where the typical plant is de-

scribed and figured. Its chief peculiarity consists in its monadelphous stamens in the ♂ flower, the central column being divided, near its summit, into two or three antheriferous forks; its sepals vary in number from two to five; its petals are three to five, longer than the sepals, extremely fleshy, and tumidly scrotiform: the ♀ flower has four, small, denticulated, subrhomboidal sepals, four or five, much larger, very fleshy, scrotiform petals, with as many shorter sterile stamens attached to their claws; three to six ovaries, with a deeply 2-3-fid reflected stigma; subglobose drupes, with a reniformly orbicular, compressed, testaceous putamen, having externally on each side a semicircular excentric impression, and an internal condyle that intrudes a short distance within the reniform cell, and which is hollow, with a minute foramen opening externally on each side; each face of the outer broad hippocrepiform ring is covered with about seven rows of close, prominent, short tubercles. The seed has a membranaceous integument that fills the cell, with a broad chalaza near the condyle, to which it is attached: the nucleus of the only seed I was able to examine was not fully developed; it evidently contained albumen, as Dr. Mueller affirms; but the form of the embryo was not visible: from this circumstance, coupled with the similarity in form of the condyle and the shape of the cell, and the resemblance of the integument, to those in *Legnephora* and *Tristichocalyx*, I have placed this genus in contiguity to them, all being of Australian origin. The details of the ♂ flower, which I have not seen, are copied from the description of Dr. Mueller.

SARCOPETALUM, F. Mueller.—*Flores* dioici. *Masc. Sepala* 2-5, parva, membranacea, biseriata, exteriora minora. *Petala* 3-5, sepalis majora, inæqualia, valde crassa et carnosa, subcuneata, obovata, apice sub-2-loba vel scrotiformia. *Stamina* 3, monadelphia; *filamenta* in columnam centralem alte coalita, apice breviter furcata et antherifera; *antheræ* bilobæ, lobis ovalibus, parallele segregatis, vel imo divergentibus, dorso adnatis, subextrorsis, sutura oblique longitudinali utrinque dehiscens. — *Fem. Sepala* 4-6, parva, biseriata, exteriora paulo minora, rhomboidea vel acute triangularia, plus minusve profunde inciso-dentata, membranacea, delicatule reticulata, glabra. *Petala* 4-6, sepalis longiora, forma scrotata marium, carnosa, glabra. *Stamina sterilia* eadem numero ac petala, iis opposita et dimidio breviora, linearia, imo latiora, apice glandulis 2 segregatis munita. *Ovaria* 3-6, gibboso-ovata, glabra, gynæcio paulo elevato insita. *Stylus* teres, subito reflexus, apice in *stigmata* 2 divaricata subulata profunde divisus. *Drupæ* 3 (vel plurimæ?), gibboso-ovata, compressæ, stylo fere basali



notatæ, glabræ, longiuscule stipitatæ, pulposæ: *putamen* tenuiter testaceum, reniformi-orbiculatum, valde compressum, utraque facie excavatione lata scutiformi impressum, ambitu hipocrepiformi tuberculis crebriter scrobiculato-rugosum, 1-loculare; *condylus* internus, parvus, ad sinum paulo intrusus, vacuus, utrinque foramine minuto extus perforatus. *Semen* loculum implens, reniformi-ovatum; *integumentum* membranaceum, lateraliter *chalaza* notatum, et hinc intra condylum insinuatum: *embryo* (forma ignota) *albumine* inclusus.

*Frutex Australiæ orientalis, scandens; folia petiolata, peltata vel obsolete peltata, deltoideo-ovata, imo cordata, vel omnino ovalia, apice subacuta, e basi 7-nervia, transversim venosa et reticulata, glaberrima, supra nitida, subtus pallide glauca: racemi ♂ in nodis annotinis aphyllis plurimi, fasciculati, vel in axillis solitarii, petiolo breviores, spicati flori et bracteolati; flores alternatim pedicellati: racemi ♀ simillimi.*

*Sarcopetalum Harveyanum*, F. Muell. Fl. Vict. 27, tab. suppl. 3; Benth. Fl. Austral. i. 57;—alte scandens; ramulis teretibus, ruguloso-verrucosis, griseis, glabris; foliis subpeltatis, deltoideo-ovatis vel oblongioribus, imo sinu profundo cordatis, dehinc gradatim acutis, mucronatis, e basi 7-nerviis, junioribus submembranaceis, demum rigidis, utrinque glabris, supra læte viridibus, venis transversis valde reticulatis, subtus olivaceo- vel fusco-glaucis, nervis venisque prominulis; petiolo striato, glabro, limbo paulo brevioribus: racemis ♂ sparsim supra-axillaribus, 1-4, vel e nodis annotinis aphyllis plurimis, petiolo dimidio brevioribus; rachi tenui, ramisque 1-3-floris brevissime strigosis; floribus pedicellatis: racemis ♀ consimilibus, aut axillaribus et solitariis, petiolo brevioribus.—In Australia: *v. s. in herb. Hook.*, Swany River (Mueller), Victoria (Mueller), Moreton Bay (Oldfield), Illawarra (Cunningham, 178).

This is described as a gigantic climber, with a thick, terete stem covered by a brownish-grey minutely verrucose bark, chartaceous leaves  $4\frac{1}{2}$ – $5\frac{1}{2}$  inches long, including a basal sinus 9–12 lines deep, 4–5 inches broad, on a petiole  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches long. The racemes are many fasciculated on the old leafless branches, or solitary far above the axil of the leaf, or two to four distinct and supra-axillary, 2–3 inches long; rachis rather slender, branching from near the base; branches alternate, 1–3 lines apart, 1–2 lines long, with a small lanceolate bract at base, bearing on their summit from one to three flowers on extremely short pedicels. I have seen only ♀ flowers: these have four nearly equal sepals in two series, very membranaceous, glabrous, subrhomboid, with

acute angles on the summit and sides, and finely denticulated along the margins; four remarkably thick and fleshy petals tapering at base and swelling into a clavated, emarginated, or scrotiform shape, subhyaline; four sterile stamens half as long as the petals, and four gibbous glabrous ovaries, each with a suddenly deflected style, cleft at its summit into two subdivergent stigmata. The pedicels in fruit grow to double their former length, crowned by a small receptacle supporting a glabrous nearly globular drupe, 3–4 lines in diameter (the other carpels being abortive): the putamen reniformly orbicular, compressed, with tuberculately rugose sides, in a lunate form, encircling the more depressed scutiform excentral condyle, which does not sensibly intrude internally; the integument fills the entire cell, attached by a short funicle to the margin of the condyle; it is filled with soft albumen, but the embryo was in too undeveloped a state to be detected. The fruit seen and described by Dr. Mueller does not appear to have been in a more mature stage.

#### 41. HYPERBÆNA.

This genus was proposed by me in 1851 for a plant which I found in the neighbourhood of Rio de Janeiro, that had only male flowers. As its fruit was then unknown, the genus was placed among those of dubious position. At that time also, for want of better knowledge, the fruit of *Cocculus Domingensis*, DC., was supposed to belong to *Anelasma* (the fruit of which was also unknown)—a supposition suggested by the circumstance, then mentioned, of the remarkable similarity in the external aspects of the species of *Hyperbæna* and *Anelasma*. Soon afterwards I ascertained that *Cocculus Domingensis*, of which ♂ flowers only were then known, belonged to *Hyperbæna*; and having seen its fruit, I was thus enabled to place it with confidence in the ex-albuminous tribe of the *Pachygoneæ*. The authors of the 'Genera Plantarum' (i. 38) state that *Hyperbæna* scarcely differs from *Cocculus*, except in its seed; but those botanists appear to have entertained a general but not very defined idea of the real structure of *Cocculus*. In *Hyperbæna* the form of the petals is different: they are always more oval, never linear, nor with deeply inflected basal lobes; the anthers are otherwise constructed and differently affixed; added to which, the mode of inflorescence in both sexes is so distinct, and the aspect of the leaves so remarkable, that it is always easy to discriminate one genus from the other by a mere glance at the specimens. The leaves are usually oblong, with an acuminate apex, coriaceous, glabrous, shining, with distant nervures all alternating

and arching together within the margin and immersed in the parenchyma. The inflorescence is peculiar, and greatly resembles that of *Anelasma*, generally consisting of a very elongated, slender rachis, with numerous filiform, lax, corymbose branches and very minute pedicellated flowers; from two to four of these raceme-like panicles issue from a tuft of hairs placed at a considerable distance above each axil. The embryo, without albumen, has large, fleshy, accumbent cotyledons, which nearly fill the entire space of the cell of the putamen. This genus is confined entirely to the South-American continent, the Antilles, and Mexico.

Dr. Eichler, in his monograph of the Brazilian *Menispermaceæ*, refers all the species of *Hyperbæna* which he describes to the genus *Pachygone*, the plants of which are exclusively of Asiatic origin. No botanist will second this conclusion who attentively compares the structure of the two genera. In *Pachygone* the petals are more linear, inflexed at the summit, with basal auricular lobes which incurvingly embrace and conceal the base of the filaments, and the 4-lobed introrse anthers, without intervening connective, burst bivalvately by a horizontal fissure—all as in *Cocculus*, and quite different from *Hyperbæna*: the latter genus has also another form of putamen, with a very different kind of condyle. Besides the difference in the floral and seminal characters, the general aspect of the plants, and more especially the peculiar mode of venation of the leaves, render it impossible for any attentive observer to confound the one genus with the other.

Mr. Bentham acknowledged the validity of *Hyperbæna* (Journ. Proc. Linn. Soc. v. Suppl. 50), but made great perplexity among the species by fusing together my *H. Mexicana*, *Hostmanni*, *Moricandi*, *valida*, and *graciliflora* into his *H. reticulata*, a species founded on a plant quite foreign to the genus: this is the *Cocculus reticulatus*, Mart., the *Anomospermum reticulatum*, Eichl. Fl. Bras. fasc. xxxix. 171, tab. 37. f. 3.

I have here indicated fifteen very distinct species, of which the first twelve, as in the typical plant, have an elongated slender inflorescence, while the last three present in each axil a fascicle of several extremely short panicles, with numerous flowers crowded into an almost sessile oblong head.

HYPERBÆNA, nob.—*Flores* dioici. *Masc. Sepala* 6, obovata vel ovalia, biseriata, 3 interiora majora, sæpe glandulis resinosis medio notata. *Petala* 6, dimidio minora, subbiseriata, ovata, integra, subplana vel rarius lateribus subintroflexa. *Stamina* 6, biserialia, petalis opposita et rarius longiora; *filamenta* apice incrassata et subdilatata; *antheræ* subdidymæ vel 2-lobæ,

lobis ovatis aut subglobosis, imo divergentibus, marginibus filamenti adnatis, plus minusve segregatis, utrinque rima laterali longitudinaliter dehiscentibus.—*Flœm. Sepala et petala* eadem ac masc. *Stamina sterilia* 6, petalis dimidio breviora et opposita, apice 2-glandulosa. *Ovaria* 3, gibbosa, gynœcio brevi hirsuto collocata, 1-locularia, *ovulo* unico latere ventrali appenso munita. *Stylus* excentricus, ex angulo interno ortus, teres, brevis. *Stigma* stylo continuum, tenuiter subulatum, longiusculum, horizontaliter reflexum, superne valde sulcatum. *Drupa* 3, vel abortu solitariæ, obovatæ vel subglobosæ, styli vestigio pedicellum versus notatæ, *sarcocarpio* crasso coriaceo vestitæ: *putamen* subovatum, paulo compressum, utrinque a basi ultra medium sulcatum, coriaceum, rarius duriusculum, 1-loculare; *condylus* transversim septiformis, a basi ultra medium loculi subdiagonaliter (rarius paulo brevius) protensus; locus exinde conspicue subbimarsupiat. *Semen* hippocrepe plicatum, loculum implens, exalbuminosum; *integumentum* membranaceum, circa condylum replicatum et per raphen et chalazam ei ligatum: *embryo cotyledonibus* magnis, carnosis, accumbentibus, medio subito replicatis, *radicula* brevissima, tereti, subsupera, ad styli vestigium basale spectante.

Frutices scandentes *Americæ meridionalis et Mexicani*; ramuli *flexuosi, in axillis nodosi*; folia *oblonga, apice sæpius attenuata, sæpe crasse coriacea, alternatim nervosa, glaberrima, petiolata*; paniculæ *axillares, racemosæ, plurimæ, sæpius rachi elongata gracili, ramis filiformibus, glabræ, e gemmula pilosa longe supra-axillari ortæ, folio sæpius longiores, rarius plurimæ petiolo breviores in capitulum axillarem approximata*; flores *glabri, minusculi*.

1. *Hyperbæna nemoralis*, nob., Ann. Nat. Hist. ser. 2. vii. 44;—*Hyperbæna Tweedii*, nob. l. c. 44; *Benth. in Journ. Linn. Soc.* v. Suppl. 50;—caule crasso, altissime scandente; ramulis glabris, junioribus ochraceo puberulis; foliis ellipticis, imo obtusis vel paulo acutis, a medio summum versus gradatim et curvatim angustioribus, apice subconstrictim obtusulo, canaliculatim recurvo et vix mucronulato, subcoriaceis, in ♂ e basi 3-nerviis, in ♀ omnino penninerviis, nervis inter se arcuatim nexis, marginibus cartilagineis, prominulis, et undulatim flexuosis, utrinque glaberrimis et subnitentibus, nervis tenuissimis venisque valde reticulatis prominulis; petiolo omnino glabro, apice tumidulo, limbo 5-plo breviora, e cupula nodosa orto: panicula ♂ elongata, racemiformi, folio 2-plo longiore, e gemma axillari producta; rachi gracili, subpuberula, alternatim ramosa; ramis plurimis, filiformibus, iterum ramulosis, glabris, bracteola minima rufo pilosa donatis; floribus pedi-

cellatis, glabris; sepalis late ovatis, planis, integris, medio glandulis pictis; petalis dimidio brevioribus, ovatis, marginibus non involutis; staminibus iis æquilongis: panicula ♀ axillari, petiolo paulo longiore, pauciramosa; ramis imo bracteolatis 1-3-floris, ramis, pedicellis floribusque glaberrimis; aut paniculis plurimis, alternis, e ramulo novello folio multo longiore aphylo enatis, racemum elongatum simulantibus; rachi validiuscula, rufo tomentosa; sepalis et petalis marium; ovariis 3, gibbosis, glabris.—In Brasilia: v. v. ♂ in Monte Corcovado, Rio de Janeiro: v. s. ♀ in herb. Hook., Porto Alegre, prov. Rio Grande do Sul (Tweedie).

Tweedie's specimens have no ♂ flowers; and as these offer many points of accordance with my plant, I have considered it the ♀ of the same species, although the leaves are more oval, generally smaller, darker, more opaque, with less prominent nerves and reticulations, and not distinctly 3-nerved at base, as in the other instance. I found the ♂ plant in Nov. 1837, in the deep forest on the Corcovado, climbing to the height of the loftiest trees: its main stem was at least 4 inches in diameter; the young branchlets, the rachis of the panicles, and the bracteoles are rufo-puberulous, while all the rest of the plant is quite glabrous. The leaves are  $2\frac{1}{2}$  inches long,  $1\frac{1}{4}$  inch broad, channelled and subrecurved at the apex, with undulating entire margins; the petiole, slightly curved at the thickened apex, is in the ♀  $\frac{1}{2}$  inch, in the ♂  $\frac{3}{4}$  inch long, being articulated at its insertion in the cupuliform node of each axil. The ♂ panicle grows out of an axillary tuft of hairs, has a slender pubescent rachis about 6 inches long; its branchlets, about 3 lines apart and 6-8 lines long, are either solitary or two or three are fasciculated together, each being corymbosely divided; the expanded flower is 1 line in diameter, the rotate petals are whitish, and half the length of the somewhat greenish sepals. The axillary ♀ panicle is 6-9 lines long; but the raceme-like aphyllous flowering branch is 4 inches long; its corymbulose branches (or panicles) are stouter than in the ♂, and are 6-9 lines long.

2. *Hyperbæna graciliflora*, nob. ;—*Hyperbæna reticulata*, Benth. in parte, Journ. Linn. Soc. v. Suppl. 50;—*Pachygone Dominicensis*, Eichl. (in parte) in Mart. Fl. Bras. xxxviii. p. 198;—ramulis teretibus, lævibus; foliis elliptico-oblongis, imo (modice acutis) apiceque (in acumine subito lineari et longiusculo) canaliculatis, obsolete peninerviis, nervis omnino immersis, costa mediana prominula, nervo marginali integro cartilagineo et revoluto, coriaceis, utrinque glaberrimis, supra lucidis, pallide viridibus, nervis venisque omnino immersis et vix manifestis, subtus paulo pallidioribus, eveniis, aut sub lente mi-

nutissime immersireticulatis; petiolo glabro, subtenui, vix striato, apice paulo tumidulo, limbo 4-plo brevior: paniculis ♂ solitariis vel geminis et superpositis, e pulvino pilosulo supra-axillari ortis, folio 2-3-plo longioribus; rachi gracillima, folio 2-plo longiore, rufo pubescente; ramulis alternatim geminatis, patentibus, iterum ramosis, capillaribus, pedicellisque laxè corymbulosis, subglabris; floribus minutis. —In Brasilia septentrionali: *v. s. in herb. meo*, Rio Casiquiare (Spruce, 3167).

This is a well-marked species, having greatly the aspect of an *Anelusma*, under which name (*Abuta*) it was distributed; when observed carefully, the difference is very manifest, especially in the nervation of the leaves. The axils are 1-1½ inch apart; the leaves are 4 inches long, 1⅝ inch broad, with a narrow acuminate point ½ inch long; they are deeply channelled both at the base and apex; the petiole is 1 inch long. One or two very elongated ♂ panicles grow out of a supra-axillary villous tuft; the rachis is 9 or 10 inches long; and from it, at alternate distances of about ½ inch, two capillary, patent, laxly ramified branches are emitted, about 1 inch long, the pedicels being 1½ line long, and the flower expanded 1 line in diameter; they have six glabrous membranaceous sepals, imbricated in æstivation, the three inner ones being the larger; six flat cuneately oval petals, somewhat smaller; six stamens, of equal length; filaments compressed, suddenly widened at the summit; anthers bilobed, the diverging lobes being laterally adnate and separated by the connective, each bursting by a longitudinal fissure; three punctiform rudiments of ovaries are seen on the summit of the short columnar andrœcium, to which the stamens and petals are attached.

Dr. Eichler, while he considers the above plant identical with *H. Domingensis* (from which it is widely distinct), strangely amalgamates all the following species with the same, under the name of *Pachygone Domingensis*,—thus confounding not only many different species, but mistaking one genus for another.

3. *Hyperbæna Moricandii*, nob., Ann. Nat. Hist. ser. 2. vii. 44;—*Hyperbæna reticulata*, Benth. (*in parte*) Journ. Proc. Linn. Soc. v. Suppl. 50;—*Pachygone Domingensis*, Eichl. (*in parte*) l. c. 198;—ramis glabris, flexuosis; foliis oblongis, imo obtusis, apice subito attenuatis, acumine angusto, canaliculato, obtuso, mucronato, a basi penninerviis, nervis arcuatim nexis, utrinque 6-7, subcoriaceis, opacis, utrinque glabris et subnitentibus, sub lente creberrime reticulatis, supra pallide viridibus, subtus pallidioribus, marginibus tenuiter cartilagineis, prominulis; petiolo e nodo cupulari orto, glabro, apice cras-

siore, limbo 5-plo brevior: paniculis ♂ racemosis, 2-4, superpositis, e gemmula pilosa supra-axillari ortis folio, paulo brevioribus; rachi gracili ramisque alternatim geminis breviusculis subcorymbosis, parce puberulis; pedicellis floribusque glabris.—In Brasilia: *v. s. in herb. Hook.* ♂, Ilheos (Moriciand, 2346).

Mr. Bentham (*loc. supra cit.*) founded a species, *H. reticulata*, on the *Cocculus reticulatus*, Mart., which is a species of *Anomospermum*, amalgamating with it, as two varieties, my *H. Moricandii*, *Mexicana*, *Hostmanni*, *graciliflora*, and *valida*; but their characters, which are now given at some length, show how much they differ from one another. This species, very distinct from the former, has its leaves about 5 inches long and 2 inches broad, on a petiole  $\frac{3}{4}$ -1 inch long. From two to four panicles spring from a hairy tuft 2 lines above the insertion of the petiole; their very slender rachis is about 5 inches long, and their geminate corymbose branchlets, about 2 lines apart, are 3-4 lines long; the sepals are cuneately obovate, entire, with glandular dots in the centre; the petals, spathulately oblong, half their length, are entire, and not introflected; the stamens, fixed on the central receptacle, are equal in length to the petals.

4. *Hyperbæna Hostmanni*, nob. in Ann. Nat. Hist. ser. 2. vii. 44; *Hyperbæna reticulata*, Benth. (*in parte*) Journ. Linn. Soc. v. 2nd Suppl. 50;—*Anelasma minutiflora*, Sagot, MS.;—*Pachygone Domingensis*, Eichl. (*in parte*) in Mart. Fl. Bras. fasc. xxxviii. p. 197, tab. 47. fig. 2;—ramulis junioribus striolatis, rufescente puberulis, demum glabris; foliis oblongo-ovatis, imo rotundatis, apice repente attenuatis, acumine brevi angusto obtusulo et mucronato, a basi pinnato-nerviis, nervis utrinque 5 arcuatim nexis, marginibus integris, subrevolutis, supra pallidis, nitidis, utrinque glaberrimis, subtus rufo-pallidis, opacis, sub lente reticulato-venosis; petiolo subtenui, apice rugoso et tumidulo, superne piloso, limbo 6-plo brevior: paniculis ♂ solitariis, racemosis, e gemmula longe supra-axillari ortis (interdum terminalibus), folio longioribus vel brevioribus; rachi, ramis brevibus ramulisque ferrugineo tomentosis, ramulis flores circiter 3 alternos pedicellatos gerentibus; sepalis 3 externis bracteiformibus pilosis, 3 interioribus duplo longioribus, cuneato-ovatis, membranaceis, glabris; petalis 6, cuneato-oblongis, dimidio brevioribus, planis, glabris; staminibus 6, his brevioribus; antheris 2-lobis, lobis lateralibus sejunctis, longitudinaliter dehiscentibus.—In Guiana: *v. s. in herb. Hook.* ♂, Surinam (Hostmann, 1050), Maná, Guienne Française (Sagot, 833).

This species appears to me very distinct from *H. graciliflora*,  
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with which and with some others it has been associated by Mr. Bentham and Dr. Eichler; it differs in its shorter, more oval, less acuminate leaves, rounded (not attenuated) at base, in its shorter petiole, and in its terminal, simple (not axillary and fasciculated), stouter raceme, with more simple and less filiform branches. The axils are 1 inch apart; the leaves are  $2\frac{3}{4}$ –3 inches long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch broad, on a petiole  $\frac{1}{2}$  inch long: the terminal raceme is 4–5 inches long, its lateral branches 3 lines apart, 3–4 lines long, each bearing from three to six one-flowered pedicels  $\frac{1}{2}$  line long, bracteolated at base; the flowers are very minute, their parts all conformable with the generic character.

5. *Hyperbæna Mexicana*, nob. loc. cit. 44;—*Hyperbæna reticulata*, Benth. (in parte) loc. cit. 50;—*Pachygone Domingensis*, Eichl. (in parte) l. c. p. 198;—ramulis subteneris, pallidis, striolatis, glabris, subflexuosis; foliis lanceolato-oblongis, utrinque attenuatis, acumine obtusulo, canaliculato, valde coriaceis, a basi penninerviis, nervis utrinque 5–6, stramineis, paulo divergentibus, longe intra marginem arcuatim nexis, supra subnitidis, flavescenti-pallidis, crassiuscule reticulatis, subtus tenuiter reticulatis, utrinque glaberrimis, nervo marginali cartilagineo prominente; petiolo supra sulcato, apice paulo crassiore, limbo 8-plo brevior: paniculis ♂ solitariis vel geminis, supra-axillaribus, racemosis, folio brevioribus; rachi tenuissima; ramis dichotome divisis, filamentosis, glaberrimis, bracteolis minutis tantum puberulis; sepalis 6, imo 2-bracteatis; petalis 6, quadruplo brevioribus.—In Mexico: v. s. in herb. Hook. (Jungensen, 91).

This species differs from all the preceding in its more lanceolate leaves, very acute at base, with shorter petioles, in its more lax panicle, with filiform rachis, and almost capillary dichotomously divided branchlets, all which are extremely glabrous, excepting the bractlets; the sepals and bracts are quite glabrous; the petals auriculate lobed on the sides, the lobes being involuted. The axils of the branch are 1 inch apart; the leaves are 4– $4\frac{1}{2}$  inches long,  $1\frac{3}{8}$  inch broad, on a petiole  $\frac{1}{2}$  inch long; the extremely slender rachis of the panicle is  $2\frac{1}{2}$ –3 inches long, its branches 1– $1\frac{1}{2}$  inch long.

6. *Hyperbæna Domingensis*, Benth. (in parte), Journ. Linn. Soc. v. 2nd Suppl. p. 50;—*Cocculus Domingensis*, DC. Syst. i. 528, Prodr. i. 99; Deless. Icon. i. tab. 96; Griseb. Fl. Br. W. Ind. p. 10;—*Anelasma Domingense*, nob. olim, in Ann. Nat. Hist. ser. 2. vii. 43;—*Pachygone Domingensis*, Eichl. l. c. p. 197;—ramulis scandentibus, teretibus, striatis, glabris; foliis ovatis, oblongo-ovatis aut oblongis, imo rotundato-truncatis obtusis



vel bisinuatis, ultra medium sensim angustioribus, apice subito breviter constrictis, acumine acuto, canaliculatum recurvo, alternatim penninerviis, subcoriaceis, utrinque glaberrimis et concoloribus, reticulatis, nervo marginali cartilagineo undulato; petiolo tereti, subtenui, apice tumidulo, glabro, limbo 3-4-plo brevioribus: paniculis ♂ racemosis, 3-4, superpositis, e gemmula pilosa supra-axillaribus, petiolo 2-plo longioribus, pubescentibus; rachi tenui, puberula; ramis alternis, filiformibus, bracteolatis, corymbulosis: vel inflorescentia e ramo novello, axillari, foliis abortivis, paniculam magnam late et laxam ramosam mentiente; ramulis divaricatis, consimilibus, fasciculatis; floribus minutis, pedicellatis: racemis ♀ solitariis vel geminis, axillaribus, petiolo 2-plo longioribus; rachi tomentosa; ramulis plurimis, approximatis, corymbose 5-floris; pedicellis alternis, caducis, drupam unicam perficientibus.—In Antillis, ♂, San Domingo (Poiteau), secund. clar. DeCandolle: *v. s. in herb. Hook.* ♂, Villa Monteverde, Cuba (Wright, 1105), Domenica (Imray, 453); *in herb. De Candolle* ♀, Guadeloupe (Krauss, 1615); ♀ *in herb. Benth.*, Jamaica (Forsyth).

Delessert's figure corresponds well with the several other species of *Hyperbana*; and though no analysis is given of its floral structure, there can be no doubt that the plant represented really belongs to this genus. The leaves in the several plants above referred to this species vary in size and in some measure in form, but they all present the same aspect: in the specimen from Guadeloupe they are smaller, and less rounded at base, all, however, maintaining the same proportional breadth and a relative length of petiole. They are  $2\frac{3}{4}$ -5 inches long,  $1\frac{1}{2}$ -3 inches broad, on a petiole  $\frac{3}{4}$ -1 $\frac{1}{2}$  inch long. The ♂ panicles are 2-5 inches long, on a very slender rachis, with corymbulose alternate branches 4-6 lines long. Delessert's drawing shows an inflorescence consisting of a number of similar panicles growing out of the axils of a young branch, from which the leaves have fallen, and it thus assumes the appearance of a very lax and compound panicle of considerable size. The flowers are extremely small, measuring only half a line when expanded; there are six sepals, with one or two bracts at base; they are all pale and membranaceous, the three outer somewhat shorter, with a few hairs outside, the three inner ones being nearly orbicular and quite glabrous; six scale-like, orbicular, membranaceous petals, only one-fourth the length of the sepals, and six stamens as long as the petals. The ♀ panicles are  $1\frac{1}{2}$ -2 inches long, with several short branches, bracteolated at their origin, 1-2 lines apart, 4 lines long, bearing about five flowers on pedicels 1-1 $\frac{1}{2}$  line long; the peduncle and pedicels thicken much as the fruit matures; but many of the ovaries wither, and often only a single drupe

becomes matured on some of the branches of the panicle. The drupe is black, the dry sarcocarp adhering firmly to the thin coriaceous putamen, which is 8 lines long, 6 lines broad, compressed on two opposite faces, each of which is marked by a very shallow groove extending from the base beyond the centre; corresponding with these grooves is an internal septiform condyle, which divides the cell for two-thirds of its length into two marsupial pouches: the seed which fills the cell is thus deeply hippocrepiform.

Dr. Eichler has associated with this nearly all the species of *Hyperbæna* here described, amalgamating them under the name of *Pachygone Domingensis*, thus falling into the double mistake of confounding together different genera and different species.

7. *Hyperbæna rotundiuscula*, nob.;—ramulis subvalidis, cupuloso-nodosis, glabris; foliis orbicularibus aut ovato-rotundatis, imo truncatis, fere cordatis, marginibus valde undulato-crispatis, apice in acumen angustum brevissimum obtusulum subito apiculatis, a basi penninerviis, nervis utrinque 5–6, arcuatim nexis, subcoriaceis, supra pallide viridibus, subtus fere concoloribus, nervo marginali cartilagineo subrevoluto; petiolo subtenui, apice tumidulo, limbo dimidio brevior: racemo ♀ fructifero, petiolo longiore; drupa fere globosa, exsiccata, glabra, putamine late ovali, scrobiculato-rugoso, paulo compresso, in utrinque facie ultra medium profundiuscule sulcato, testaceo, condylo tenuiter septiformi sulcis apposito; semine valde hippocrepiformi.—In Cuba: *v. s. in herb. Hook.*, Cuba (Wright, 23).

This plant differs from the preceding species in its nearly orbicular leaves truncated at base, undulating on their thickened margin, with an extremely small apicular point, a comparatively much longer petiole, and a smaller, rounder, and more testaceous putamen. The leaves are  $2\frac{1}{2}$ – $2\frac{5}{8}$  inches long,  $2$ – $2\frac{1}{2}$  inches broad, on a petiole  $1\frac{1}{4}$  inch long. The fructiferous racemes, solitary or geminate above each axil, are  $2$ – $2\frac{3}{4}$  inches long, having from four to six drupiferous pedicels 3–4 lines long; the putamen is 5 lines long,  $4\frac{1}{2}$  lines broad one way, 4 lines wide the other; the condylar semidissepiment, corresponding with the external furrows on each face, extends 4 lines within the cell, leaving a bimarsupial space filled by the hippocrepiform exalbuminous seed.

8. *Hyperbæna retinervis*, nob.;—alte scandens, omnino glaberrima, ramulis teretibus, striatis; foliis majusculis, oblongis, imo rotundatis, a medio sensim angustioribus, acumine acuto vel obtusiusculo, e basi 3-nerviis, nervis extus ramosis et cum alteris lateralibus arcuatim nexis, ad nervum marginalem

prominentem crenatis, utrinque pallidis, glaberrimis, venis prominentibus, valde reticulatis, et in areolis sub lente minutissime punctulatis; petiolo tenui, apice paulo tumidulo, limbo 6-plo brevior.—In Antillis: *v. s. in herb. De Cand.*, Puerto Rico (Bertero).

This species differs from all the preceding in the much larger dimension of its leaves, the sinuose crenulations of their marginal nerve, and the relatively much shorter petiole. Although the specimen has neither flower nor fruit, there can be no doubt, from its habit, the texture and venation of its leaves, and its locality, that it belongs to this genus and is closely allied to *Hyperbæna Domingensis*. It was sent to Prof. De Candolle by M. Balbis in 1820, and was found climbing to the loftiest trees. Its internodes are about 2 inches long; the leaves are  $6\frac{1}{2}$  inches long, 3 inches broad, on a petiole 1 inch long, which is articulated in the very prominent cup-shaped node of the axil: the surface of the leaves on each side, in all the deepened areoles of the small prominent reticulations, appears frosted when seen under a lens, and marked with very minute impressed dots—a feature seen also in some of the other species, where it is less marked.

9. *Hyperbæna Prioriana*, nob.;—ramulis teretibus, striatis; foliis ellipticis, sursum gradatim angustioribus, utrinque obtusis, alternatim pinnatis, nervis basalibus 2–4 plus minusve approximatis, alteris remotioribus, cunctis versus marginem anastomosantibus, crebre reticulato-venosis, nervo marginali cartilagineo, utrinque glaberrimis, subtus paulo pallidioribus; petiolo tenui, apice longe incrassato, striolato, glabro, limbo dimidio brevior: paniculis ♂ 3–4, superpositis, supra-axillaribus, puberulis, petiolo paulo longioribus; ramis brevissimis, spicatim alternis, bracteolatis, flores 3–4 fere sessiles glomerulatos minimos glabros gerentibus; floribus parvis, glabris, imo bracteolis 2 parvis extus pilosulis donatis; sepalis 6, quorum 3 interioribus cuneato-rhomboideis duplo majoribus; petalis 6, minimis, cuneato-ovatis, lateribus vix inflexis; staminibus 6, æquilongis, unguibus petalorum affixis: racemis ♀ 3–4, superpositis, supra-axillaribus, simplicibus, petiolo brevioribus, pedicellis alternis imo bracteolatis, 1-floris; floribus subdeclinatis; sepalis et petalis paulo majoribus; ovariis 3, glabris; stigmatibus brevi, obtuso, horizontaliter deflexo.—In Jamaica: *v. s. in herb. Dr. Alex. Prior*, ♂ et ♀ (Prior).

A very distinct species, remarkable for the comparative smallness of its leaves upon very long slender petioles, and its many superimposed panicles. The axils are  $\frac{1}{4}$ – $\frac{3}{4}$  inch apart; the leaves are 2–2 $\frac{1}{2}$  inches long, 1–1 $\frac{1}{4}$  inch broad, upon slender petioles,

9 lines long in the ♂, 12 lines long in the ♀: frequently the peduncles of four panicles, distinctly superimposed in a straight line above the base of the petiole, issue from the branch; they are  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long, with alternate branches barely 1 line long, bearing at their apex three almost sessile minute flowers, which have completely the structure of the order: the ♀ inflorescence is quite the same in all respects, except that it consists of simple racemes, not panicles, each rachis with pedicels bearing only a single flower instead of a small capitulum of three flowers.

10. *Hyperbæna valida*, nob.;—*Hyperbæna reticulata*, *Benth. l. c.* 50;—*Pachygone Domingensis*, *Eichl. l. c.* 198;—ramulis validis, pallidis, glabris, substriolatis, inter nodos subcupulosos subflexuosis; foliis oblongis, imo obtusis, ultra medium sensim angustioribus, apice acutis aut obtusiuscule attenuatis, calloso mucronulatis, valde coriaceis, utrinque glaberrimis, supra recurvatim canaliculatis, nitidis, penninerviis, nervis utrinque 8 vel 9, tenuibus et arcuatim nexis, paulo prominulis, marginibus cartilagineis, revolutis, supra pallidis, subtus concoloribus, creberrime et prominule reticulatis; petiolo valido, rigido, curvato, cum cupula nodosa articulado, superne subcanaliculato, limbo 8–10-plo brevior: pedunculo ♀ petiolo brevior, 2–3-floro; drupa pedicellata, oblonga, exsiccata, glabra; putamine coriaceo, crasso; condylo intra loculum breviter et oblique septiformi.—In Antillis: *v. s. in herb. Hook.*, Jamaica (Purdie).

A well-marked species, allied to *H. Moricandii*, but with narrower leaves, not suddenly attenuated at summit, less rounded at base, and on a stronger petiole of half the length: it is extremely different from *H. Domingensis* in the size and shape of its leaves and petioles, and in its much larger fruit, on a stouter peduncle and pedicel. Its internodes are  $\frac{1}{2}$ – $\frac{3}{4}$  inch long; the gutter-shaped leaves, with an arching midrib, are thick and shining, 4– $4\frac{1}{2}$  inches long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch broad, with two delicate basal nervures which run parallel with the margin for nearly half its length, and six very slender divergent nerves on each side of the midrib; the very stout curved petiole is about 6 lines long; the fructiferous peduncle is 3 lines long, having a single remaining pedicel 2 lines long; the drupe is nearly an inch long,  $\frac{3}{4}$  inch in diameter, with a hard thick sarcocarp and a coriaceous putamen, having a strong septiform condyle directed obliquely nearly halfway into the centre of the cell.

11. *Hyperbæna longiuscula*, nob.;—ramulis teretibus, striatis; foliis lanceolatis, imo longe cuneatis, ultra medium gradatim acutatis, acumine subobtusis, coriaceis, utrinque glaberrimis,

alternatim peuninerviis, nervis tenuissimis divaricatis, venisque conspicue reticulatis, utrinque omnino immersis, supra subpallidis, nitidis, subtus pallidioribus, costa pallida, vix prominente, marginibus incrassatis; petiolo ruguloso, glabro, subtenui, limbo 5-8-plo brevior: racemis ♀ axillaribus, solitariis, geminis vel ternis, in fructu petiolo æquilongis aut paulo longioribus; rachi incrassata; pedicellis brevissimis, paucis, alternis, apice receptaculo globoso incrassatis; drupa ea præcedentis 3-plo minore, subglobosa; putamine coriaceo, subtenui, subscrobiculato, condylo valido, septiformi, fere ad medium loculi protenso; radícula minutissima.—In Cuba: *v. s. in herb. Mus. Brit.*, Cuba (Wright, 1854).

A species differing from all the preceding in the shape and texture of its leaves; the axils are  $\frac{1}{2}$ – $\frac{3}{4}$  inch apart; the leaves are 3-5 inches long, 1-1 $\frac{1}{4}$  inch broad, on a petiole 6-8 lines long; the fructiferous racemes are  $\frac{1}{2}$ -1 inch long, bearing from three to five fructiferous pedicels, scarcely 1 line long, terminated by a clavate receptacle 1-1 $\frac{1}{2}$  line in diameter; the putamen, covered by a very thin dry sarcocarp, is coriaceous, of rather thin texture, 4 lines long, 3 $\frac{1}{2}$  lines broad, the septiform condyle extending 1 $\frac{1}{2}$  line within the cell; the fleshy exalbuminous cotyledons fill the cell, conjoined by an extremely minute radicle.

12. *Hyperbæna cuneifolia*, nob.;—ramulis teretibus, vix striolatis, pallidulis; foliis valde cuneatis, elliptico-oblongis, apice rotundiusculis, valde coriaceis, margine cartilagineo, omnino glaberrimis, supra subnitentibus, penninerviis, nervis venisque reticulatis plane immersis et vix distinctis, pallide viridibus, subtus pallidioribus, eveniis, nervo medio flavido vix prominulo, margine cartilagineo subrevoluto; petiolo tereti, striato, apice rugoso et tumidulo, flavido, glabro, limbo 6-plo brevior, e cupula nodosa articulato: racemo ♂ axillari, petiolo 2-plo longiore, rufo puberulo, floribus breviter pedicellatis, crebre alternis et bracteolatis: racemis ♀ axillaribus, solitariis vel binis, petiolo 2-plo longioribus; rachi subvalida, brevissime puberula; floribus alternis, fere sessilibus; drupis brevissime pedicellatis, glabris, subglobosis; putamine transversim subovali, compresso, cartilagineo, lineis punctatis hippocrepicis sulcoque e basi brevi notato; condylo septiformi, brevi, loculo hinc reniformi breviter interrupto; cotyledonibus amplis, carnis; radícula minuta et acuta, ad hilum spectante.—In Cuba: *v. s. in herb. Hook.*, Villa Monte Verde, Cuba orient. ♀ (Wright, 1104); ♂, Cuba (Wright, 1853); *in herb. Mus. Brit.* ♂ et ♀, Cuba (Wright, 1853).

This is very distinct from all others, and extremely different from another species collected by Wright in the same locality

(his No. 1105). The nodes are 4–10 lines distant; the leaves  $1\frac{3}{4}$ – $2\frac{1}{4}$  inches long,  $\frac{3}{4}$  inch broad, on a petiole 4 lines long. The ♀ raceme is  $1-1\frac{1}{4}$  inch long; the pedicels, 1–2 lines apart,  $\frac{1}{2}$ –1 line long, are scabridly tomentose, and support a drupe about 7 lines in diameter, the remains of the style being 2 lines above the basal point of insertion; the putamen is  $4\frac{1}{2}$  lines long from the base, 5 lines broad, and  $3\frac{1}{2}$  lines deep; the condyle, obliquely septiform, is formed, as in *H. Domingensis*, by the duplicature of the placental lamina, and separates the base of the cell into two pouches for about one-third of its length; the cotyledons, filling the space of the cell, are very fleshy and lunately incurved round the septiform condyle, to the extremity of which the integument is attached: this structure is quite in conformity with that of the genus.

13. *Hyperbæna crebriflora*, nob.;—ramulis pallidis, striatis, junioribus subpuberulis; foliis lanceolato-oblongis, imo rotundis, summum versus gradatim et curvatim angustioribus, apice obtusis, subcoriaceis, læte viridibus, nitidis, omnino penninerviis, nervis alternis utrinque 8 venisque valde reticulatis subimmersis, utrinque glaberrimis, subtus concoloribus, nervis venisque magis manifestis, nervo marginali cartilagineo, undulato, subrevoluto, costa circa basin pubescente; petiolo striato, subpuberulo, limbo 7-plo brevior: racemulis ♂ axillaribus, 3, fasciculatis, petiolo paulo brevioribus; pedicellis plurimis, 1-floris, crebre alternis, capitulum oblongum conficientibus, floribus omnino glaberrimis: racemis ♀ similibus, pedunculo bracteisque pubescentibus, pedicellis floribusque glabris; sepalis 9; petalis 6, oblongis, integris; staminibus 6; ovariis 3, glabris, stigmate tereti, subito horizontaliter deflexo.—In Cuba: *v. s. in herb. Mus. Brit.* ♂ et ♀ (Wright, 1855).

This and the two following species ought to constitute a distinct section of the genus, which might be termed "*crebrifloræ*," distinguished by the inflorescence in both sexes being condensed into a very short, sessile, spicated head of numerous closely aggregated flowers, altogether not longer than the short petiole, while in all the preceding species the ♂ inflorescence is in the form of an elongated slender paniculated raceme. As I can perceive no difference in the structure of the flower in either sex, I have placed these plants in *Hyperbæna* until the structure of the fruit is known. In this species there is a difference in the size and texture of the leaves in the two sexes, those of the ♀ being broader, with the rounded base obsolete cordate, with more prominent reticulations. In the ♂ plant the leaves are  $1\frac{3}{4}$ – $3\frac{1}{8}$  inches long, 9–15 lines broad, on a petiole 4–5 lines long: in the ♀ specimen they are  $3\frac{3}{8}$  inches long, 19 lines broad,

on a petiole 6 lines long. The three ♂ spicated racemules, fasciculated in each axil, are 4 lines long, as thickly beset as possible with 1-flowered pedicels 1 line long, bracteolated at base, the peduncle, pedicels, and bracts being covered with yellowish pubescence; the nine sepals, in ternary series, are quite glabrous, obovate, the inner series much larger and rotately reflexed at the apex; petals 6, one-third shorter, orbicular, margins somewhat involute or plane; stamens those of the genus: the ♀ racemes are similar in size; but the pedicels are not so closely aggregated, the pedicels being glabrous; the sepals and petals are like those of the ♂ in shape and size; the six sterile stamens are in the form of minute round glands; the three ovaria are gibbous and glabrous, the horizontally reflexed stigma terete and channelled above.

14. *Hyperbæna banisteriæfolia*, nob.;—*Cocculus banisteriæfolius*, *A. Rich. Ann. Sc. Nat.* xvii. 136; *Walp. Rep.* i. 95;—*Cocculus oblongifolius*, *Mart. (non DC.) in Fl. Beibl.* xxiv. *Appendix*, ii. 43; *Walp. Rep.* ii. 748;—*Pachygone oblongifolius*, *Eichl. in Mart. Fl. Bras.* fasc. xxxviii. p. 197, tab. 47. fig. 1;—ramulis erectis, fulvo aut rufo tomentosis; foliis approximatis, elliptico-ovatis, imo summoque rotundatis, apice breviter constrictis, acumine canaliculatim recurvo et mucronato, coriaceis, subtriplinerviis cum nervo marginali cartilagineo prominulo, et 2 alteris basalibus mox evanidis, nervis lateralibus alternis utrinque 3 arcuatim nexis, utraque facie subnitidis, concoloribus, valde reticulatis, fere glabris, subtus tantum in costa media pubescentibus; petiolo apice incrassato et puberulo, demum subglabro, limbo 6-plo brevior: paniculis ♂ axillaribus, solitariis vel geminis, petiolo brevioribus, fulvo tomentosus, cylindræis, spicatim densifloris; ramis brevissimis, crebriter alternis, apice 3–6-floris; floribus fere sessilibus, imo bracteolatis; sepalis 6, biseriatis, rotundato-ovalibus, extus parce pilosulis, marginibus sub-erosis, 3 interioribus 2-plo majoribus; petalis 6, late ovatis, his duplo minoribus, lateribus sæpe obsolete lobatis et involutis, glabris; staminibus petalis paulo longioribus; ovariis rudimentaribus 3, super gynæcium centrale insitis: paniculis ♀ axillaribus, solitariis, petiolum æquantibus, rufo tomentosis; ramis alternis, sub-3-floris, floribus pedicellatis, pedicellis demum incrassatis; sepalis et petalis marium; ovariis 3; drupa oblonga; putamine oblongo, subcompresso, utrinque ultra medium sulcato, coriaceo, condylo sulcis opposito, septiformi; semine generis.—In Brasilia, *v. v.* in sinu Jurujuba, prov. Rio de Janeiro: *v. s. in herb. Mus. Brit.* ♂, Rio de Janeiro (Bowie).

The plant which I collected in the Bay of Jurujuba (an exten-

sive bight opposite Rio de Janeiro) agrees well with that obtained in the same neighbourhood by Gomez and described by Richard. These also fully accord with the *Cocculus oblongifolius* of Martius, which has been again described and figured by Dr. Eichler under the name of *Pachygone oblongifolius*, from a specimen found at Cape Frio, in the same province and at no great distance from Jurujuba. There can be no doubt, therefore, of their identity. My specimen bears ♂ flowers; both the others, which I have not seen, are in fruit. There is no difference in the descriptions of Richard and Eichler, except that in the one the drupe is said to be only half the size of the other—a difference owing probably to the fruit in one not being matured. It is certainly a distinct species, inasmuch as all those before described have a very elongated ♂ inflorescence, except the one immediately foregoing, where, as in this instance, the flowers are condensed into a short cylindrical spicated head. The structure of the putamen, with its septiform condyle, is precisely that of *Hyperbæna Domingensis*, upon which the carpological features of this genus were established, and notably distinct from that of the East-Indian genus *Pachygone*, to which Dr. Eichler has referred the species, and where the putamen is nearly orbicular and osseous, with an obsolete condyle.

This is a shrub with somewhat erect branches, with axils 3–6 lines apart; the leaves are  $2\frac{1}{2}$ – $2\frac{3}{4}$  inches long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch broad, on a petiole 6–7 lines long: the ♂ raceme is about 6 lines long, bearing the appearance of an imbricated axillary oblong tuft, crowded with very small, reddish, pubescent ♂ flowers, the structure of which is quite conformable to the genus. Dr. Eichler has figured the ♀ inflorescence, 5–8 lines long, which is more laxly paniculate than the ♂; the drupes are shown 6–8 lines long, the seed of which, owing to the length of the septiform condyle, is deeply hippocrepiform, as in *Diplochisia* and *Tiliacora*.

15. *Hyperbæna Columbica*, nob. ;—*Pachygone Columbica*, *Eichl. in Mart. Fl. Bras. fasc. xxxviii. 198*;—ramulis validis, erectis, teretibus, striolatis, subtomentosis; foliis longiuscule oblongis, imo oblique rotundatis, apice attenuatis, acumine obtuso mucronulato, pinninerviis, creberrime reticulatis, firmiter coriaceis, nitidis, glaberrimis; petiolo patente, tereti, apice tumidulo, limbo 5–8-plo brevioribus: racemis ♂ 6–12, supra-axillaribus, petiolo multo brevioribus, glomerulatis; pedicellis brevissimis, simplicibus vel parce ramosis, 1-floris, imo bracteolatis, fulvo hirtellis vel glabriusculis; sepalis 6–9, exterioribus ovato-lanceolatis, interioribus elliptico-orbicularibus, membranaceis, glabris; petalis minoribus, obovatis, marginibus basalibus parumper involutis.—In Colombia.



I have not seen this plant, the characters of which are taken from Dr. Eichler's description. It is certainly not a *Pachygone*, which is entirely an Asian genus: from the size, shape, texture, and nervation of its leaves, it resembles many species of *Hyperbæna*, with which the structure of its male flowers agrees; and in its inflorescence, with many aggregated, extremely short axillary panicles, it comes very close to *Hyperbæna crebriflora* and *banisteriaefolia*. Its thick rigid leaves are above 5 inches long, and  $2\frac{1}{2}$  inches broad, on a petiole 1 inch long; the smaller leaves are 2 inches long,  $\frac{3}{4}$  inch broad, on a petiole  $\frac{1}{4}$  inch long; the nervation of the leaf is very different from that of *Pachygone* or *Cocculus*, consisting of from eight to twelve pairs of pinnate nerves which anastomose and become divided into very minute reticulations—a character almost peculiar to this, among the South American genera of the order. The panicles (six to twelve in each axil) are  $\frac{1}{4}$ – $\frac{1}{2}$  inch long, the flowers being  $\frac{1}{2}$  line in diameter, in which character it sufficiently agrees with the two last-mentioned species.

#### 42. CHONDRODENDRON\*.

This genus, proposed in 1794 by the authors of the 'Flora Peruviana' (Prodr. 132), has been recognized by few botanists. De Candolle (Syst. i. 522) referred the typical plant to *Cocculus*, while Persoon regarded it as a species of *Epibaterium* (Ench. ii. 561). Original specimens exist in the herbaria of the British Museum and of M. de Boissier, each with a label in Ruiz's handwriting; so that the identification of the genus is placed beyond doubt: this is a fact of some importance, because hitherto its real characters have been involved in much obscurity. Pöppig in 1838 described and figured a plant (also from Peru) under the name of *Chondrodendron convolvulaceum*, which he conceived to be a second species with female flowers: but in this reference he was greatly mistaken; for it belongs to my genus *Odontocarya*; and this mistake has given rise to the many misconceptions that have been entertained concerning the genus. When I published my first notes on the *Menispermaceæ*, in 1851, I knew nothing of *Chondrodendron* beyond the mere details of the male flower given in the 'Prodromus' of Ruiz and Pavon: two years afterwards I first saw the typical ♂ plant; and it was only

\* I have here corrected the name of this genus, which was originally misspelt in the Prodromus of Ruiz and Pavon, through an error in the press, which is evident, because they state distinctly that the name was suggested by the verrucosities upon the branches (*χόνδρος*): it is right, therefore, that this error; which has been reiterated by all botanists since that time, should now be rectified.

lately that I ascertained with certainty the structure of the female flower and fruit, as derived from Spruce's plant from Tarapota. These showed that my genus *Botryopsis* differs in no respect, except in the relative size of its petals, and convinced me that it should now merge into *Chondrodendron*. Mr. Bentham, in his "Notes on Menispermaceæ" (Journ. Linn. Soc. v. 2nd Suppl. p. 47), misled by Pöppig, also misapprehended the nature of the genus, and, influenced by his desire to abridge species, even went so far as to state his conviction that the *Chondrodendron convolvulaceum*, Pöpp., is specifically identical, not only with *Chondrodendron tomentosum*, R. & P., but also with several distinct Brazilian species of *Odontocarya*. In my description of the latter genus (*suprà*, pp. 59, 60, 99) and of *O. convolvulacea* (p. 63), I have animadverted upon these misconceptions.

Dr. Eichler, in his monograph of the Brazilian *Menispermaceæ*, in Martius's 'Flora Brasiliensis,' adopts the mistaken views of Mr. Bentham, and entangles with *Chondrodendron tomentosum*, R. & P., all the species of *Odontocarya* which I have described, amalgamating all into a single species: this confusion is still further increased by his description of two species under *Botryopsis*, into the first of which he fuses most of the species of *Chondrodendron* enumerated below, his second species being confined to Spruce's plant from Tarapota. The copious analyses which he has figured in plate 36 for *Chondrodendron*, in reality represent the structure of *Odontocarya*, a genus belonging to a very different tribe of the family; while those given in plate 48 as being figurative of *Botryopsis* illustrate the characters of *Chondrodendron*.

Under *Botryopsis* (*l. c.* p. 199), Dr. Eichler describes *Chondrodendron* as being furnished with the unusual number of twelve petals, in which respect he is plainly again in error; for, contrary to all analogy, he has considered the six innermost sepals to be petals, forgetting that they are the largest of the whole series, which are imbricated around them in gradually decreasing whorls, and that, like all the rest, they are pubescent externally; while the six true petals are decidedly shorter and glabrous; and, indeed, in Spruce's plant (which he correctly figures) they are reduced almost to the size of hypogynous scales, one-sixth of the length of those sepals which he incorrectly regards as petals. The justness of these observations may be seen by reference to the analyses given, in plate 48, of his *Botryopsis platyphylla* and *B. Spruceana*. It is therefore evident that *Chondrodendron* does not depart from the usual rule in the family, of having six petals, corresponding with an equal number of stamens. Owing to this misapprehension, the generic diagnosis of Dr. Eichler requires correction: he attributes to the genus

from nine to twelve sepals; but if we add to these the six parts above mentioned, we must reckon, from his own details, a total of from fifteen to eighteen sepals—the number I originally stated.

This circumstance brings the genus *Sychnosepalum* of Dr. Eichler much closer to *Chondrodendron* than he imagined, the principal distinction of the former consisting in the unusually great number of its sepals, as its name imports. He describes three species, to the first of which he attributes from eighteen to twenty-four, and to the second eighteen sepals, thus corresponding to the number in *Chondrodendron*; his third species, to which he attributes a still greater number of sepals, will be seen to belong to a very different genus, to which I gave the name of *Detandra*\*. The next character which Dr. Eichler considers peculiar to *Sychnosepalum* is the presence of six free carpels, fixed by their stipitate supports upon a raised gynæcium: this is also a prominent feature in *Chondrodendron*, where the six ovaries become matured into as many stipitated drupes, which remain so firmly attached to the receptacle that they can seldom be separated without rupture of the parts. In these respects, and in the habit of the plants, as well as in the manner of their inflorescence, there is an absolute identity of characters between the two genera. The only feature that remains by which *Sychnosepalum* can be distinguished is the structure of the stamens, which is certainly very different from that in *Chondrodendron*. Confiding in the accuracy of the analytical figures given by Dr. Eichler, I have acknowledged his genus, for the same reasons, partly, that I maintained *Anelasma* distinct from *Abuta*, and also *Elissarrhena* from *Anomospermum*: but in those instances this is not the only differential feature; for others are found in the habit of the plants, in the venation of the leaves, and the character of the inflorescence. Dr. Eichler, however, refused to acknowledge the validity of such differences, and fused the two former and the two latter genera into each other. If he persist in this view, he cannot avoid sinking *Sychnosepalum* into *Chondrodendron*, especially as it possesses fewer claims to maintain its distinctness than the others.

It should be mentioned that in the new 'Genera Plantarum,' at p. 34, the name *Odontocarya* should be placed instead of *Chondrodendron*; and, again, at p. 38, *Chondrodendron* should be substituted for *Botryopsis*: in the latter paragraph there is a reference to the *Cocculus cotoneaster*, DC. (Syst. i. 525) (in Delessert's 'Icones,' i. tab. 93), as an illustration of the genus *Chondrodendron*, which shows how little the *Menispermaceæ* have

\* *Suprà*, p. 18; Ann. Nat. Hist. ser. 3. xiii. p. 124.

been understood even by the most eminent botanists. There is nothing in the habit of that plant, in the venation or form of its leaves, or in its inflorescence that approaches this genus: it is the drawing of a well-known Syngenesious plant from Chile, the *Proustia oblongifolia*, Don, with a panicle in an undeveloped state, as may readily be seen by comparing it with the dried plant, with which it agrees in all respects, even showing its spinuliform stipules.

All the species of *Chondrodendron* are climbing plants, natives of Peru, Guiana, and Brazil. The leaves are usually subcoriaceous, glabrous above, somewhat tomentose beneath, often with lengthened petioles inserted upon, or a little within, the margin of the blade; the inflorescence assumes the form of long, lax, racemose panicles; the male flower consists of from twelve to eighteen sepals, externally smaller, the outermost minute and bracteiform, all imbricately placed in ternary series upon a somewhat cylindrical torus; six petals in two series, shorter than the larger sepals, or sometimes reduced in size and scale-like, are affixed to the andrœcium; stamens six, in two series, the inner ones connivently erect, free to the base, but compacted upon the summit of the gynœcium, the outer ones slightly curved, all surmounted by 2-celled anthers, the cells being separated by a fleshy connective, which is introrsely excurrent, the long apical obtuse points all inclining towards the centre. The female flowers have a similar number of sepals and petals, but no stamens, or only rudimentary ones; generally six ovaries are somewhat stipitately affixed on a central gynœcium; six or fewer drupes radiately attached, each firmly affixed by its long support upon a large clavate receptacle, which terminates the pedicel; the putamen is ovoid, subcompressed, coriaceous, bimar-supially divided by a septiform condyle, like that in *Hyperbæna*, which extends from the base beyond the centre, as in *Tiliacora*: the seed, which fills the cell, is thus deeply hippocrepical, exalbuminous, with two large, fleshy, accumbently curved cotyledons, and a very small radicle pointing to the style, which, owing to the excentric growth, is brought down close to the base of the fruit.

CHONDRODENDRON, R. & P. *Botryopsis olim, nob.* — *Flores* dioici. *Masc. Sepala* 12–18, ordine ternario imbricatum disposita, ad torum subcylindricum seriebus alternis crebriter affixa, gradatim minora, exteriora minima, bracteiformia, extus pilosula, 6 interiora majora, elliptica, apice subreflexa. *Petala* 6, staminibus opposita, interdum rotundata et squamiformia vel sæpius sepalis interioribus paulo minora, cuneato-oblonga, carnosula. *Stamina* 6, biserialia, cen-

tralia, libera, ad basin arcte aggregata, et in toro cylindrico subconnata, apice conniventia; *filamenta* curvatim suberecta, apice valde incrassata, clavæformia et inflexa; *antheræ* 2-loculares, loculis ovatis, segregatis, subimmersis, utrinque rima longitudinali dehiscentibus; *connectivo* crasso, in apiculum longum introrsus curvatum sæpe subbifidum excurrente.—*Fœm.* *Sepala* et *petala* marium. *Stamina sterilia* 6, minima aut nulla. *Ovaria* sæpius 6, erecta, gynæcio brevi inserta, gibboso-oblonga, sursum tenuiora, glabra, 1-locularia, *ovulo* unico lateri interno appenso. *Stylus* subnullus. *Stigma* rhomboideum, acutum, convexum, medio carinatum, deorsum reflexum. *Drupæ* 6 vel abortu pauciores, gibboso-vel cuneato-oblongæ, imo longiuscule stipitatæ, et ad torum majusculum affixæ, subhorizontaliter radiantes, vix pulposæ, stigmati basi proximo notatæ; *putamen* subcuneato-oblongum, paulo compressum, utraque facie a basi ultra medium sulcatum, chartaceo-coriaceum, 1-loculare; *condylus* omnino internus, septiformis, sulcis septo adversis, a basi ultra medium protensus. *Semen* loculum bimarsupiatum implens, et circa condylum hippocrepice subito inflexum, exalbuminosum; *integumentum* membranaceum, hippocrepice plicatum, in sinu *chalaza* obscura notatum, et hinc linea incrassata ad condylum adhærens; *embryo* valde carnosus, *cotyledonibus* magnis, accumbenter hippocrepice incurvis, rarius paululo inæqualibus, *radicula* brevi parva supra ad stigma spectante multiplo longioribus.

Frutices *scandentes* *Americæ meridionalis intertropicæ*, cortice *tuberculato*, ramulis *ad axillas cupuloso-nodosis*; folia *alterna*, *suborbicularia*, *ovata aut oblonga*, rarius *subcordata*, sæpe *paululo peltata*, e basi 5-nervia, *supra glabra*, *subtus sæpe subtomentosa*; petiolo *utraque extremitate tumido*: *paniculæ elongatæ*, *aut solitariae et axillares vel in ramis annotinis aphyllis perplurimæ et fasciculatæ*; flores *minimi, pedicellati*.

1. *Chondrodendron tomentosum*, R. & P. (non Benth. nec Eichl.), Prodr. Fl. Per. 132, Syst. 261;—*Epibaterium tomentosum*, Pers. Ench. i. 561;—*Cocculus Chondodendron*, DC. Syst. i. 522, Prodr. i. 98;—ramis valde tuberculatis, cortice amarissimo; ramulis teretibus, subglabris, striatis; foliis orbiculari-ovatis, imo subtruncatis, sinu latissimo vix cordatis, sursum gradatim angustioribus, apice valde rotundatis et subemarginatis, in nervo marginali crenulatis, e basi 5-nerviis, nervis validis, prominulis, extus ramosis, marginibus subcrenulatis, subcoriaceis, supra glabris, pallide viridibus, nervis nitidis, stramineis, reticulatis, subtus dense flavido tomentosus, in nervis prominentibus brunneis; petiolo apice incrassato, sub-

striato, flavide farinoso-tomentoso, limbo æquilongo aut brevior, margini inserto: panicula ♂ axillari, fulvo tomentosa; rachi petiolo crassiore et fere 2-plo longiore, compressa, striata, ramosa, basi longiuscule nuda; ramis plerumque brevibus, aut solitariis vel 2-3 fasciculatis, alternatim pedicellatis et paucifloris; sepalis 6, interioribus ovatis, imo rotundatis et saccato-concavis, carnosulis, glabris, margine ciliatis.—In Peruvia: *v. s. in herb. Mus. Brit. et De Boissier*, Pilláo, in lat. 10° S. (Ruiz et Pavon).

There can be no doubt in regard to the authenticity of the above specimens of the typical species, as they are accompanied by a ticket in Pavon's handwriting. The main branch is nearly  $\frac{1}{2}$  inch in diameter; and its cross section shows the medullary rays usually seen in the family; its bark is firm, rugose, and covered with numerous raised tubercles, which suggested the name of the genus: the foliaceous and floriferous branches are about  $1\frac{1}{2}$  line thick, and smooth; the internodes are  $2\frac{1}{2}$  inches long; the leaves are  $3\frac{1}{2}$ – $3\frac{3}{4}$  inches long, 3– $3\frac{1}{2}$  inches broad, with a basal sinus 1 line deep; the petiole, continuous with the midrib, is palately inserted, and is  $2\frac{1}{2}$ – $2\frac{3}{4}$  inches long. The male flower has fifteen sepals, of which the nine more exterior, in three series, becoming gradually smaller, are bractiform, membranaceous, pubescent, with ciliate margins, and the six others more internal, biserial, much larger, equal, oval, round and saccately concave at base, fleshy, glabrous, with ciliated margins, somewhat erecto-patent; the six petals are squamiform, one-sixth the length of the inner sepals, somewhat orbicular, fleshy, fixed at the base of the filaments upon the gynæcium; the filaments are linear, compressed, swollen towards the summit, sigmoidly curved, as long as the inner sepals, and, as well as the petals, rugosely punctated; the oblong anther-cells are divaricate at base, and partly imbedded antically and laterally in the fleshy summit of the filament, which is prolonged and contracted at the apex into a long, curved, obtuse, mucronate point; each anther-cell is longitudinally divided by a diaphragm, from which the margins of its two valves break away.

2. *Chondrodendron cretosum*, nob.;—*Botryopsis platyphylla*, *Benth.* in *Journ. Linn. Soc.* v. Suppl. 2. 51;—*Botryopsis Spruceana*, *Eichl. in Mart. Fl. Bras.* fasc. xxxviii. p. 199, tab. 48. f. 1;—ramulis fuscis, teretibus, glabris, junioribus tomentosis, striatis; foliis deltoideo-orbiculatis, imo cordatis, a medio sursum angustioribus, apice rotundatis, plus minusve emarginatis, calloso-mucronatis, marginibus crenulatis, e basi 5-nerviis, submembranaceis, supra glabris, opacis, in nervis tenerrimis

nigris immersis sulcatis, subtus albido-cretaceis et subtilissime tomentellis, nervis tenerrimis brunneis vix prominulis; petiolo tomentello, striato, imo et apice incrassato, limbo longiore, margini inserto: panicula ♂ axillari et terminali, e basi ramosa, petiolo dimidio longiore, tomentosa; rachi ramisque teneribus, teretibus; ramulis brevissimis, 1-4, fasciculatis, 1-2-floris; floribus siccis aurantiacis, subglabris: racemo ♀ axillari; pedicello fructifero apice incrassato; drupis 4, globoso-ovatis, stylo circa basin notatis, longiuscule stipitatis, supra torum valde auctum radiatim insitis.—In Peruvia alta: *v. s. in herb. variis*, Tarapota, in lat. 6° S. (Spruce, 4474).

This species, very distinct from *C. platyphyllum*, differs from the preceding in its less truncate, more cordate, more orbiculate leaves, clothed beneath with very fine white tomentum, their much thinner texture, their upper surface not at all shining, with immersed sulcate nervation, the lateral nerves originating close to the base of the leaf, the ♂ inflorescence being often divided at base into two or four raceme-like panicles half the length of the petiole, and in the form of its sepals. The leaves are 4-4½ inches long, including the basal sinus nearly ½ inch deep, 4½-5½ inches broad, on a petiole 3¾-4 inches long. The ♂ inflorescence divides at its base into several panicles 2-2½ inches long, their branches 2-4 lines long, often fasciculated, sometimes supporting a single flower, others being branched and 2-flowered. The flower has only six external bracteiform sepals, pilose outside and glandular at base, and six more internal, biserial, longer, equal, spathulately oblong, acute, submembranaceous, all with ciliate margins, the three outer of which are pilose externally, the other three being glabrous,—all horizontally reflected from the middle; the six petals are scale-like, as in the preceding species; but there is sometimes a seventh in the centre of them: the stamens have a flattened linguiform apical expansion; and the anther-lobes are more deeply imbedded laterally in the much thicker summit of the filament, and consequently are more parallel; the drupes are 5 lines long, supported by a fleshy carpophorus 1 line long.

3. *Chondrodendron platyphyllum*, nob.;—Botryopsis platyphyllum, nob. olim in *Ann. Nat. Hist.* ser. 2. vii. 43; *Benth. l. c.* 51; *Eichl. (in parte) Fl. Bras.* fasc. xxxviii. p. 199;—Cocculus platyphyllum, *St. Hil. Pl. Us.* tab. 42, *Fl. Br. Merid.* i. 59; *Walp. Rep.* i. 95;—ramulis scandentibus, striatis, glabris, compressiusculis, subangulosis, junioribus tomentosis; foliis subpeltatis, late et deltoideo-orbicularibus, imo sat profunde cordatis, infra summum plus minusve constrictis, apice obtusis, e basi 5-nerviis, margine crenulatis, supra glabris, subtus

incauo-tomentosis, nervis brunneis prominentibus; petiolo subtenui, striato, compresso, subtomentoso, folio fere æquilongo, paulo intra marginem inserto.—In prov. Diamantina Brasiliæ.

I have not seen this plant, which was found in the far inland and elevated region of the Diamond district, without either flower or fruit, and which has been confounded by botanists with many different species. It differs from the two former, although it much resembles them in the peltate insertion of the petiole upon the blade, by its much larger leaves, which are as broad as, or even broader than, long, more deeply cordate, and obtusely triangular at the summit; they are  $3\frac{1}{2}$ –6 inches long,  $4\frac{1}{2}$ –6 inches broad, with a basal sinus  $\frac{3}{4}$  inch deep, on a petiole inserted about a line within the margin of the sinus.

Dr. Eichler has referred to this species many others here described, which will be seen to be very different; and among them he includes, as another synonym, the *Cissampelos Abutua* of the 'Flora Fluminensis' (x. tab. 140), on account of its habit and the shape of its drupes; but that plant, in the form and size of its leaves, in their venation, and more especially in the size and oval shape of its drupes, offers a more complete resemblance to *Abuta*, to which genus I referred it long ago (Ann. Nat. Hist. ser. 3. vol. xiv. p. 258, *et suprâ*, p. 86) under the name of *Abuta macrophylla* (*Cocculus macrophyllus*, St.-Hil. & Tul.), to which species it unquestionably belongs. Upon this point I can speak with confidence, having examined the same plant, which I collected in the forests near Rio de Janeiro.

4. *Chondrodendron obscurum*, nob.;—ramis altissime scandentibus, brunneo-opacis, cortice firmo, rugoso, tuberculis parvis signato; ramulis teretibus, valde striolatis, glabris, axillis subapproximatis, cupula magna prominente munitis; foliis subpeltatis, late ovatis, imo leviter 2-sinuato truncatis, apice subacutis, mucronulatis, in nervo marginali prominente undulato-crenulatis, e basi 7-nerviis, nervis infimis mox evanescentibus, utrinque glaberrimis, supra subnitidis, in nervis tenuibus subimmersis sulcatis, subtus sordide fulvescentibus, pruinoso-glaucis, nervis venisque valde reticulatis prominentibus; petiolo imo breviter abrupte tumido, cum cupula articulato, apice longe incrassato, striato, pruinoso-brunneo, limbo fere æquilongo; panicula ♂ ex axillis aphyllis annotinis enata, brunneo tomentosa, latissime ramosa; rachi breviuscula, crassa; ramis alternis, approximatis, elongatis, divergentibus, ultra medium nudis, dehinc patentim ramulosis, ramulis apice corymbulosis; sepalis 15, in seriebus quinque circa torum cylindraceum arcte imbricatis, alternis, fuscis,



glabris, marginibus tenuioribus, ciliato-pilosis, gradatim extus minoribus, iis serierum 2 interiorum oblongioribus, quam exteriora triplo majoribus, apice recurvis, reliquis magis ovalibus; petalis 6, spathulato-oblongis, sepalis brevioribus, glabris, marginibus papillois; staminibus iis æquilongis, erectis, filamentis apice crassioribus et intus inflexis; antheris hinc horizontalibus, lobis sejunctis lateraliter semiimmersis, connectivo longe excurrente recurvo: racemo ♀ ex axillis annotinis solitario, brunneo-tomentoso; rachi valde elongata, flexuosa et pendula, ramosa; ramis longiusculis, divaricatis, apice paucifloris; pedicellis ad apicem in receptaculum magnum subglobosum auctis; drupis 6, oblongis, glabris, carnosulis, longe stipitatis, toro affixis et radiatim divaricatis.—In Brasilia: *v. v.* ♂ et ♀ in montibus Organensibus prov. Rio de Janeiro.

This species was first collected by me in 1827, when I found it climbing to the summit of a tree 100 feet high; all its branches within reach were then bare of leaves, and from them I obtained fructiferous specimens: subsequently I met with male specimens; and upon these I proposed the genus *Botryopsis*, since found to be too close to *Chondrodendron* to be separated from it. The bare branches are 4 lines in diameter, the leaf-bearing branchlets 1 line thick, having their axils 4–6 lines apart, these being enlarged by very prominent cup-shaped nodes, upon which the petioles are articulated. The leaves are 3–5½ inches long, 2½–4¾ inches broad, on a petiole 2–3¾ inches long. The stump of the compound ♂ inflorescence, growing out of the old leafless nodes, is about ½ inch long, 1½ line thick, closely beset with several cupular articulations, from which as many branches divaricate at nearly a right angle, 3–5 inches long, bare at base, with branchlets 3–4 lines apart, ½–1 inch long, with secondary branchlets, 2 lines long, bearing at their summit three flowers on pedicels 1½ line long. The fifteen sepals, in five series, are arranged upon a rather elongated torus, adpressedly imbricated on one another in an oblong cylindrical form, all being of a dark fuscous colour, glabrous, with whitish ciliated margins, the summits of the two inner series being patently expanded; in the inner series they are 1¾ line long, the outer ones ½ line long; the petals are oblong, narrower towards the base, slightly concave, fleshy, with thinner subpapillose margins, as long as the stamens, and two-thirds the length of the inner sepals. The ♀ raceme is 10 inches long, its branches ¾–3 inches long, with branchlets 3–5 lines long, bearing pedicels 4 lines long, swollen at their apex into a tumid receptacle 2 lines in diameter, which supports six radiating stipitated drupes 8 lines long, 4½ lines in diameter. It differs from the preceding spe-

cies in its much smaller leaves, which are not deltoidly orbicular, not deeply cordate, nor incano-tomentose beneath.

5. *Chondrodendron cinerascens*, nob.;—*Cocculus cinerascens*, *St. Hil. Fl. Bras. Mer.* i. 59; *Walp. Rep.* i. 95;—*Botryopsis platyphylla*, *Eichl. (in parte) l. c.* 200;—ramulis scandentibus, flexuosis, striatis, junioribus cinereo-tomentosis, demum glabris et nitidulis; foliis subpeltatis, rotundato-ovatis vel ovalibus, imo rotundiusculis vel paululo cordatis, apice subacutis vel rotundatis, mucronulatis, marginibus remote et irregulariter crenatis, valde undulato-crispatis, e basi 3–5-nerviis, nervis inferioribus mox evanidis, coriaceo-rigidis, supra glaberrimis vix nitidis, sub lente rugulosis, nervis extus ramosis anastomosantibus venisque valde reticulatis immersis, subtus cinereo- vel flavido-glaucis, adpresse puberulis, nervis venisque transversis prominentibus et rufescentibus; petiolo subvalido, tereti, striato, tomentoso, imo apiceque tumidulo, limbo triplo brevior: paniculis ♂ axillaribus, sæpius 3, ramulis abortivis ortis, divaricatim ramosis, pubescentibus; rachi folio longiore, ramis longiusculis, iterum iterumque divaricatim ramulosis, ramulis ultimis apicem versus flores plurimos breviter pedicellatos gerentibus; sepalis 18, extus gradatim minoribus, quorum 6 externis minutis et bracteiformibus, 6 interioribus obovatis, majoribus, striato nervosis, puberulis, cunctis pallidis, carnosulis, marginibus membranaceis et piloso-ciliatis; petalis 6, sepalis paulo brevioribus, ovato-oblongis, carnosulis, pallidis, lineis 2 divaricatis crassis notatis, margine glandulose ciliolatis: racemis ♀ axillaribus, 3, fasciculatis, pendulis, folio longioribus, longe ramosis, pedicellis drupas 1–4 gerentibus.—*In Brasilia: v. s. in herb. Mus. Brit.* (Bowie & Cunningham).

This species differs from the preceding in its darker and more rigid leaves, upon much shorter petioles; they are sparsely clothed beneath with greyish adpressed hairs; its flowers are not more than half the size of the former, are more pubescent, quite pallid, and arranged in more straggling panicles: the branches are not so straight, and the axils are not beset with such conspicuously prominent cupular nodes. The leaves are  $3\frac{1}{4}$ –4 inches long,  $3$ – $3\frac{3}{4}$  inches broad, on a petiole  $1\frac{1}{4}$ – $1\frac{1}{2}$  inch long, inserted  $1\frac{1}{2}$  line within the margin. The inflorescence rises out of an abortive axillary branchlet, 2 or 3 lines long, which throws out three straggling panicles 5–6 inches long, with very patent branches  $\frac{1}{2}$ – $1\frac{1}{2}$  inch long, the secondary branchlets 2–3 lines long, the tertiary ones 1 line long, bearing three or four crowded flowers: there are eighteen sepals, if we include the six more external ones that look like very minute bracts, all being shorter and more compactly imbricated than in the former species, the

three or six interior (1 line long) being somewhat reflected at their apex; they are all very pale and somewhat fleshy.

6. *Chondrodendron amulum*, nob.;—*Cocculus platyphyllus*, Mart. (non St. Hil.) *Fl. Bot. Zeit.* xxiv. *App.* 2. 42;—*Botryopsis platyphylla*, Eichl. (in parte) *l. c.* 200, tab. 48;—ramulis teretibus, dense fusco vel ferrugineo tomentosis; foliis subpeltatis, late ovatis vel angustioribus et oblongis, imo rotundatis vel leviter cordatis, apice rotundatis et subemarginatis, vel sensim acutis, e basi 7-nerviis, nervis infimis mox evanidis, marginibus revolutis, integris aut obsolete crenulatis, planiusculis, textura firmulis, supra glabris, subnitidis, nervis subsulcatis, subtus sordide cinerascentibus et sub lente tomentellis, nervis venisque anastomosantibus prominentibus brunneis; petiolo tereti, imo apiceque incrassato, striato, fusco-tomentoso, limbo triplo vel dimidio brevior: paniculis ♂ e nodis annotinis aphyllis perplurimis, fasciculatis, rarius axillaribus et solitariis, ferrugineo tomentosis, rachi folio longiore, gracili, e basi remotiuscule et longiuscule ramosa, ramis tenuibus, imo nudis et ultra medium ramulosis, ramulis corymbulosis et paucifloris; floribus parvulis; sepalis 15, in seriebus ternariis valde imbricatis, extus pubescentibus, gradatim minoribus, 9 exterioribus bracteiformibus, acutiuscule ovatis, 6 interioribus majoribus, æqualibus, subacute ovatis, concavis, imo rotundatis; petalis illis paulo brevioribus, oblongis vel lanceolato-oblongis, utrinque acutiusculis, extus glanduloso pruinosis, marginibus glandulose ciliolatis; staminibus 6, andrœcio insitis, imo fere nexis, filamentis apice incrassatis, antherarum lobis sejunctis, lateraliter semiimmersis, subverticalibus, connectivo longiuscule excurrente, sursum recurvo.—In Brasilia: v. s. ♂ in herb. *De Cand.* (Martius, *Herb. Fl. Br.* 170, sub *Cocc. platyphyl.*); in herb. *De Boissier* ♂, Bahia (Luschnatt, A.D. 1841).

This plant, distributed by Prof. von Martins under the name of *Coc. platyphyllus*, is very different from the species of St. Hilaire, though nearly allied to it. Dr. Eichler has followed in the wake of other botanists in confounding many different plants under the same name. I have regarded Luschnatt's specimen as belonging to this species; for the differences between it and the other above quoted are very small. The internodes are about  $1\frac{1}{2}$  inch long, the axils being furnished with cupular nodes, upon which the petioles are articulated. The leaves are  $4\frac{3}{4}$ –5 inches long,  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches broad, rarely with a basal sinus 1 line deep; they are quite flat, the margins (not crisped; with a nerve prominent below) being almost entire; the petiole, thickened at both extremities, is  $1\frac{1}{2}$ – $2\frac{3}{4}$  inches long, and is inserted  $\frac{1}{2}$ – $\frac{3}{4}$  line within the margin. From forty to fifty slender

racemose panicles, of various lengths, but mostly 8 inches long, are fasciculated in the cicatrices of the axils of the older aphyllous branches; but in the younger branches they are axillary and solitary, 7 or 8 inches long, with a very slender rachis, having branches at intervals of  $\frac{1}{2}$ –1 inch apart, and 2 inches long, each with shorter branchlets, 4 lines long, bearing from three to five pedicellated flowers. The flowers are alike in both the specimens above quoted, except in that from Bahia, wherein the petals are more lanceolate; in other respects there is little difference.

7. *Chondrodendron ovatum*, nob.;—*Cocculus ovatus*, Vell. *Fl. Flum.* x. tab. 141;—*Cocculus platyphyllus*, var. *Ildefonsianus*, *St. Hil. et Tul. Ann. Sc. Nat.* sér. 2. xvii. p. 134;—*Cocculus paniculigera*, *Mart. Fl. Beibl.* ii. 43; *Walp. Rep.* ii. 348;—*Botryopsis platyphylla*, *Eichl. (in parte)* l. c. 200;—scandens, ramulis teretibus, glabris, junioribus tomentosis; foliis rhomboideo-ovatis, imo subcuneatis et bisinuatis, lobo basali anguste rotundato, ultra medium gradatim subacutis, marginibus integris, undulatis, e basi 5-nerviis, supra læte viridibus, omnino glabris, nisi junioribus ad junctionem nervorum pilosulis, nervis tenuissimis venisque prominulis, subtus opacis, cinereo-vel fulvidulo-glaucis, nervis venisque transversis valde prominentibus, glabris, in junioribus puberulis; petiolo imo apiceque incrassato, striato, pubescente, demum glaberrimo, limbo paulo brevior: panicula ♂ in ramulis junioribus axillari, petiolo paulo longiore, pubescente, rachi ultra medium ramosa, bracteolata; ramis subdivaricatis; ramulis corymbulosis, paucifloris.—In Brasilia, prov. Rio de Janeiro et Minas Geraës (in sylvis Japorensibus, Mart.): *v. s. in herb. Mus. Brit.* (Claussen).

The diagnoses given, as above cited, of *Coc. Ildefonsianus* and *Coc. paniculigera* both agree with Velloz's figure; and the latter gives a faithful representation of the species, which I have seen in Claussen's specimen, and which is certainly very distinct from all others. It may be well to observe that we have here a proof of the general accuracy of the illustrations of the celebrated Brazilian botanist, upon which much reliance should be placed; for I possess several of his original drawings from which the plates of the 'Flora Fluminensis' were copied; they are pen-and-Indian-ink drawings, are evidently sketched by an experienced eye, with well-drawn very fine lines; but the lithographic plates executed in Paris are clumsy and coarse copies made by unskilled draughtsmen, wholly ignorant of botany. It is owing to this circumstance that botanists have not placed that amount of faith in Velloz's great work which is justly due to it.

In the plate cited, taken from a young flowering branch, the axils are  $1-1\frac{1}{2}$  inch apart; the leaves are  $3\frac{1}{2}-4\frac{1}{2}$  inches long,  $3-3\frac{1}{2}$  inches broad, on a pubescent petiole  $1\frac{1}{2}-1\frac{3}{4}$  inch long. The ♂ panicle is  $3\frac{1}{2}$  inches long; its branches, at intervals of 3 to 6 lines, are  $\frac{1}{2}-\frac{3}{4}$  inch long, with a bract at base 2 lines long, and are again divided, each branch bearing about three pedicelated flowers, in which the inner sepals are reflected at their summit, as in most of the preceding species. Claussen's specimen is without flowers; the leaves are  $5\frac{1}{4}-6$  inches long,  $4\frac{3}{4}-5\frac{1}{4}$  inches broad, with the basal lobe 4-6 lines long, 9 lines broad, upon a petiole  $4-4\frac{1}{2}$  inches long and palately inserted.

8. *Chondrodendron nemophilum*, nob.;—scandens, ramosum, cortice rugoso et rimoso; ramulis glabris, cinereo-glaucis, junioribus pubescentibus; foliis subpeltatis, ovatis, imo rotundiusculis et late subcordatis, apicem versus gradatim acutis vel rotundioribus, cuspidate brevi mucronatis, marginibus integris, e basi 3-5-nerviis, supra pallidis, nitidis, glaberrimis, nervis sulcatis, valde reticulatis, subtus pallidioribus, obsolete puberulis, cinereo-glaucis, nervis flavidulis venisque tenuissimis prominulis; petiolo subtenui, imo vix crassiore, glabro, striato, pulverulente opaco, limbo fere dimidio brevior: panicula ♂ axillari, racemosa; rachi folio æquilonga vel longiore, pubescente; ramis subbrevibus, ramulis flores 2-4 breviter pedicellatos gerentibus; sepalis 15, gradatim minoribus, ovalibus, extus pilosis, carnosulis; petalis 6, ovatis, carnosulis, glabris, subpruinosis.—In Brasilia: *v. s. in herb. Mus. Brit.* Rio de Janeiro (Gardner, 5353); montibus Organensibus (Gardner, 5676).

This species differs from all the preceding, approaching more to *C. platyphyllum*; but the leaves are less than half the size, more oval, more pallid, and glabrous. The leaves are  $2\frac{3}{4}-4\frac{3}{4}$  inches long,  $2\frac{1}{2}-3\frac{3}{4}$  inches broad, on a petiole  $1\frac{1}{2}-1\frac{3}{4}$  inch long, inserted half a line within the basal margin. The ♂ raceme-like panicle is  $3-3\frac{1}{2}$  inches long, its branches 6 lines long, its branchlets 1 line long, bracteolated at base, and bearing from one to four aggregated, nearly sessile, very small flowers.

#### 43. SYCHNOSEPALUM.

In treating of *Chondrodendron*, I have already commented on this genus, which was established by Dr. Eichler in Martius's 'Flora Brasiliensis.' I there showed how much it agrees with the former genus in habit and inflorescence, in the number of its sepals, petals, and stamens in the ♂, and in the number of

floral parts, with six stipitated ovaries, in the ♀ flower. The only difference consists in the stamens; for in *Sychnosepalum* the outer filaments, always shorter, are free almost to the base, while the three inner ones, for nearly their whole length, are united into a central column, and at other times all the stamens are equally and more or less partially agglutinated together in two series; the anthers are 2-celled, the cells being introrse, oval, dorsally affixed on the apex of a narrower filament, collateral at their summit, but very divaricated at their base, and bursting by an obliquely longitudinal fissure. On the other hand, in *Chondrodendron* the stamens are free to the base, and, though connately erect in two series, they are all firmly agglutinated to the andræcium; the filaments are thickened clavately at the summit, which is incurved, the anther-cells being lateral, widely separated and partially imbedded in the thick connective, which terminates in a long, salient apical point, these points of the stamens being connivent in the centre. Notwithstanding the great identity of characters before mentioned, I consider this difference in the structure of the stamens to be a feature of considerable importance, and consequently I do not hesitate to acknowledge *Sychnosepalum* upon the same ground that I formerly urged in the instances of *Anelasma* and *Elissarrhena*. But in these latter cases Dr. Eichler has refused to acknowledge the validity of this distinction; and as long as he persists in that determination, he should consistently relinquish his claim for the distinctness of *Sychnosepalum*, and merge it into *Chondrodendron*—a course which I do not recommend. Dr. Eichler describes three species, two of which are recognized below; but his third species belongs to a very different genus, one which I formed many years ago upon two Brazilian plants of Blanchet's collection: one of these, *Detandra ovata*, nob., is the *Sychnosepalum microphyllum*, Eichl. The fruit is not yet known; but, from the singular resemblance of the ovaria of its ♀ flowers, and in the relation of its floral parts, to those of *Chondrodendron*, we may anticipate a similar seminal structure: I have therefore placed *Sychnosepalum* following the genus last mentioned.

SYCHNOSEPALUM, Eichl.—*Flores* dioici. *Masc. Sepala* 15–24, ordine ternario dense imbricata, exteriora gradatim minora, oblonga, acuta, extus valde pilosa, rigidiuscula, erecta, 6 interiora majora, elliptico-oblonga, subæqualia. *Petala* 6, sepalis dimidio breviora, oblonga, apice paulo truncata, imo gradatim angustiora, concava, lateribus a summo ad basin utrinque inflexis, carnosula, extus pilosa. *Stamina* 6, biseriata, petalis opposita, a basi plus minusve monadelphæ; *filamenta* erecta, 3 exteriora paulo breviora, fere ad basin libera, teretia,

3 interiora fere ad summum in columnam centralem coalita aut rarius breviter coalescentia; *antheræ* 2-lobæ, filamento latiores, dorso adnatæ, lobis ovalibus, summo contiguis, imo divaricatis, rima obliqua singulatim introrsum dehiscentibus.—*Fœm*: *Sepala* et *petala* ut in masc. *Stamina sterilia* 6, libera, petalis opposita et æquilonga; *filamenta* tenuiter teretia, erecta; *antheræ* effætæ, minutæ, glandulæformes. *Ovaria* 6, gibboso-oblonga, imo stipitata, apice in *stylum* brevem gradatim attenuata, extus pilosa, summo gynæcii insita, erecta et conniventia. *Stigmata* breviter subulata, paululo patentia. *Drupæ* (immaturæ solum visæ) ut in *Chondrodendro* ad receptaculum crassum affixæ, *putamine* 1-loculari et a *condylo* septiformi e basi intruso 2-marsupiato, *semine* ignoto.

Frutices scandentes in *Brasilia septentrionali* et *Guiana crescentes*; folia *petiolata*, *ovata*, *subacuminata*, *integra*, 5-*nervia*, *transversim venosa*, *coriacea*, *pilosa*: paniculæ ♂ *supra-axillares*, *solitariæ* vel *geminae*, *spicatum ramosæ*; ramis *brevibus*, *paucifloris*; floribus *brevisime pedicellatis* aut *sessilibus*.

1. *Sychnosepalum Paraëense*, Eichl. in Mart. Fl. Bras. fasc. xxxix. p. 203, tab. 49. fig. 1;—ramulis teretibus, subflexuosis, dense tomentellis; foliis ovatis aut oblongiusculis, imo rotundato-subtruncatis, petiolum versus breviter obtusulis, ultra medium sensim angustioribus, apice subacuminatis et acutis, e basi 3–5-nerviis, nervis extus ramosis, nervis utrinque prominentibus, lateralibus paucissimis, venis crebre transversim parallelis, reticulatis, supra puberulis, demum subglabris, subtus densissime albido, griseo vel fuscescente tomentellis; petiolo tereti, tenui, apice valde tumido, imo sensim crassiore, tomentello, limbo dimidio brevioribus: paniculis ♂ axillaribus, solitariis aut geminis, racemiformibus, valde pubescentibus, folium superantibus; rachi subtenui, alternatim ramosa, ramis minime bracteolatis, flores 5–15 pedicellatos bracteolatos alternos gerentibus, alabastris pyriformibus; sepalis 18–24, ternatim imbricatis, lanceolato-oblongis, extus gradatim minoribus et bracteiformibus, extrinsecus pilis griseis dense adpresso-villosis; petalis 6, obovatis, crassis, apice plus minusve 3-lobatis et emarginatis, extus pilosis, margine ciliatis; staminibus 6, biserialibus, petalis subæqualibus, inter se plus minusve coalitis: panicula ♀ axillari, simillima, sed petiolo subbrevisiore.—In *Brasilia septentrionali*, prov. Para.

I have not seen this plant, but I have remoulded the specific character from the excellent drawing above cited. The internodes are about  $\frac{3}{4}$  inch long, or shorter towards the extremity of the branch; the leaves are  $3\frac{1}{2}$ – $4\frac{1}{2}$  inches long and  $2$ – $2\frac{1}{2}$  inches

broad, on a petiole  $1\frac{3}{4}$ –2 inches long. A single panicle springs out of each lower axil, and two panicles out of the upper axils: these are generally 6 inches long, though sometimes not exceeding 2 inches; their branches, 4–6 lines apart, furnished at base with an acute bractlet  $\frac{3}{4}$  line long, vary in length from 6 to 21 lines, and bear alternately single-pedicellated flowers out of as many bractlets somewhat shorter than the pedicels, which are  $\frac{3}{4}$  line long, the flower before expansion being 1 line long.

2. *Sychnosepalum Sagotianum*, Eichl. *l.c.* p.203, tab. 49. fig. 2;—*Abuta tomentosa*, *Sagot*, *MS.*;—ramulis teretibus, cinereo-velutino tomentosis; foliis ovatis, imo cordatis, a medio sensim angustioribus, acuminatis, valde acutis et mucronatis, e basi 5-nerviis (cum nervulis 2 alteris basalibus mox evanidis), coriaceis, supra fusco-viridibus, nitentibus, nervis tenuibus venisque transversim reticulatis vix prominulis, omnino glabris, nisi in nervis (ubi interdum subpuberula sunt), subtus fulvo vel ferrugineo tomentosis, nervis venisque prominentibus; petiolo prorsus subtenui, ferrugineo tomentoso, limbo brevior: panicula ♂ axillari, racemiformi, fulvo tomentosa, folium superante; ramis plurimis, alternis, bracteolatis, flores alternos subsessiles gerentibus, alabastris ovatis; sepalis 15, ternatim dispositis, extus adpresse villosulis; petalis 6, integris, oblongo-ovatis, lateribus introflexis; staminibus 6, quorum 3 exteriora libera erecta, 3 fere ad summum monadelphæ; antherarum lobis divaricatis, subglobosis, subintrorsis.—In Guiana Gallica: *v. s. in herb. Hook.*, Karouany (*Sagot*, 19).

This is a scandent plant, differing from the preceding species in its cordate leaves, the number of its sepals, and in its stamens, in which the outer series is constantly free. The leaves are  $3\frac{1}{2}$ – $4\frac{1}{2}$  inches long,  $2\frac{1}{4}$ – $3\frac{1}{4}$  inches broad, the basal sinus being 4 lines deep, or sometimes less; the petiole, not tumescent at the apex, is nearly of equal thickness throughout, and is  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch long. The panicle in the only specimen I have seen is incomplete, all its branches having fallen, leaving the rachis only, with two or three sessile flowers on its summit; the rachis is 5 inches long. I examined a single flower with great care, which was of an oval shape and  $1\frac{1}{2}$  line long; it certainly had only 15 sepals, in outwardly gradually decreasing series, very imbricated and erect. The petals were entire, of an oval form, two-thirds the length of the sepals, very pilose outside, with the nearly straight margins inflected from near the summit to the base; the three free stamens were as long as the petals, the three inner ones, rather longer, were united nearly to their summit into a central column: at the point of their junction I observed a much smaller dwindled stamen of accidental abnormal growth.



## 44. HÆMATOCARPUS.

This is a very peculiar genus, established upon the *Fibraurea hamatocarpus* of the authors of the 'Flora Indica;' but it is very different from that genus, and belongs to quite another tribe, its proper place being among the *Pachygoneæ*. It is remarkable for its fleshy fruit, which is far larger than any yet known among the *Menispermaceæ*. I am indebted to Dr. Thomson for one of the drupes, which he brought home in spirits; this enabled me to mark its distinctive features more completely than could possibly be done in the dried state. The drupe is of a dark colour, of a rounded oblong form,  $1\frac{3}{4}$  inch long,  $1\frac{1}{8}$  and 1 inch in its two transverse diameters, is supported on a fleshy stipitate support  $\frac{1}{2}$  inch long, and articulated on the globose receptacle of the pedicel. The putamen is of a dark colour, thin, and coriaceous in consistence,  $1\frac{1}{4}$  inch long, 8 lines in diameter one way, 6 lines across in the other direction, oblong, with straight sides, narrower towards the base, with a shallow grooved line running from that point along each of its broader faces for about three-fourths of their length, which grooves correspond with an internal transverse septum (the condyle), that divides the cell for the length just stated into two deep marsupial pouches, as in *Tiliacora*; the cell thus interrupted by the condyle is of a hippocrepical shape, with two very long, parallel, approximated arms, each semicircular in its cross section. The outer surface of the putamen is densely bristled with innumerable delicately membranaceous flat hairs (if they may be so called) about 2 lines long, and imbedded in thick fleshy pulp, much in the manner described in *Odontocarya* (*suprà*, p. 60). The seed fills the space and assumes the same shape; the integument is membranaceous, attached at its duplicature to the condyle, and marked near that point by a dark chalaza; there is no albumen; the two fleshy cotyledons occupy nearly the whole space of the cell, are 2 inches long, suddenly and accumbently bent to half that length by their sudden duplicature round the septiform condyle; the radicle,  $\frac{1}{8}$  inch long, and therefore only one-sixteenth part of their entire length, is narrow and conical, situated at the lower extremity of one of the divisions of the cell.

In the Hookerian Herbarium, under *Tinomiscium*, I found a specimen, without leaves, but with ♂ flowers, which, I consider, belongs to the typical species, especially as it is also from Khasya, and from a similar elevation (3000–4000 feet). I was led to this conclusion by comparing it with another specimen, also from Khasya, having leaves of a similar texture and peculiar venation, and a habit quite conformable with *Hæmatocarpus*

*Thomsoni*: on a former occasion I had selected this plant as the type of a new genus, *Baterium*\*, which now, therefore, merges into *Hæmatocarpus*. Another specimen in the same herbarium, without flowers, from the neighbouring district of Sikhim, may be considered the counterpart of the ♂ flowering specimen which I have referred to the typical species: it quite agrees with the ♀ plant in the size, texture, and venation of the leaves, only that they are a trifle broader and rounder at base. In all these specimens the leaves are oblong, acuminate, somewhat thick and coriaceous, very glabrous, subpolished above, glaucous beneath, with two principal simple nerves springing from the base, running parallel with the margin, and then arching with other, short, lateral nerves that rise from the midrib beyond its middle. In both species the ♂ inflorescence has from two to four panicles fasciculated in the axils, each on a slender rachis longer than the leaves, with short alternate branches, each bearing two small pedicelled flowers: these have twelve sepals in imbricated ternate series, gradually smaller outwards, membranaceous, glabrous, with ciliated margins, and marked with coloured spots; the six petals are half the length of the larger sepals, oblong, somewhat dark and fleshy, with two small, erect, auricular scales fixed upon their claw; the six stamens are opposite to them, the filament being short, flat, thin, widening at the apex suddenly into a larger, orbicular, membranaceous connective, which is galeately concave, with two much smaller anther-lobes widely separated, subdivaricated, and partly imbedded in its lateral margins, each opening introrsely by an obliquely longitudinal fissure; these stamens are in two series, connivent, and somewhat imbricated; in the centre, upon a short raised receptacle, are three abortive, small, subulate ovaries. The ♀ flower is not yet known.

I have adopted for the generic name that originally given to the typical plant, substituting for it, specifically, another to commemorate the name of its discoverer. The red colour of the fleshy sarcocarp of the fruit suggested the name *Hæmatocarpus*.

HÆMATOCARPUS, nob. †;—*Baterium*, nob. (♂).—*Flores* dioici. *Masc. Sepala* 12–15, in seriebus 4–5 alternatim disposita, gradatim minora, membranacea, ciliata, guttatim picta, 6–9 exteriora suborbicularia, 6 interiora majora, subæqualia, obovata, æstivatione imbricata. *Petala* 6, sepalis dimidio minora, ovata, fusca, glabra, marginibus membranaceis, imo auriculis 2 minimis involutis munita. *Stamina* 6, petalis æquilonga et opposita, biserialia, subimbricata, andrœcio centrali affixa;

\* See my synopsis of the genera of the *Menispermaceæ* (*suprà*, p. 18).

† *Suprà*, p. 18.

*filamenta* libera, brevia, apice in connectivum magnum late orbiculatum galeato-concavum submembranaceum guttatum pictum desinentia; *antheræ* 2-lobæ, lobis remote sejunctis, oblongis, subdivergentibus, submembranaceis, latere utroque connectivo semiimmersis et rima obliqua introrsum dehiscens. *Ovaria sterilia* 3, minima, subulata, filamento æquilonga, centralia.—*Fœm.* *Sepala* et *petala* ignota. *Ovaria*, e cicatricibus in toro notatis, 4–6. *Drupæ* totidem vel abortu solitariae, ovali-oblongæ, maximæ, carnosæ, singulatim *carpopodio* longiusculo et crasso stipitatae, styli vestigio haud procul hoc notatae; *putamen* subparallele oblongum, paululo compressum, imo aliquantulo angustius, tenuiter coriaceum, a basi longe ultra medium utraque facie sulcatum, extus fibrillis seu pilis tenuiter membranaceis anguste loriformibus erectis in pulpam carnosam immersis dense vestitum; *condylus* internus, septiformis, sulcos externos adversus, ultra medium loculi protensus; locus hinc profunde bimarsupiat. *Semen* loculo conforme; *integumentum* membranaceum, latere interiore *chalaza* notatum et ad condylum affixum: *embryo* exalbuminosus, parallelim et adpresse plicatus, hinc longe bicurvis; *cotyledones* magnæ, crassissimæ, longissimæ, semiteretes, accumbentes, *radicula* brevi conica ad stylum spectante 16-plo longiores.

Frutices *Himalayenses*, *scandentes*; folia *petiolata*, *oblonga*, e basi 3-nervia, crasso-coriacea, glaberrima: paniculæ ♂ *racemosa*, supra-axillares, 2–3, fasciculatae, rachi tenui, folio longiore, ramis brevibus, paucifloris: racemus ♀ *axillaris*, pauciflorus, fructifer petiolo paulo longior; pedunculus crassus, lignosus, toro subgloboso terminatus; drupæ 3–6, horizontaliter radiantes, toro affixæ.

1. *Hæmatocarpus Thomsoni*, nob.; — *Fibraurea hæmatocarpa*, Hook. & Th. *Fl. Ind.* i. p. 204; — ramulis flexuosis, validis, teretibus, obsolete striatis, glabris; foliis oblongis, imo rotundatis vel obtusis, summum versus constrictis, in acumine longiusculo obtusulo vel acuto canaliculatim recurvo calloso-mucronatis, imo 3-nerviis, nervis divaricatis, cum aliis pinnatim alternis utrinque 4 intra marginem arcuatim nexis, vix prominulis, crasso-coriaceis, undulatis, utrinque glabris, supra pallide viridibus, nitentibus, marginibus cartilagineis et revolutis, subtus pallide vel albide glaucis, nervis rubicundis venisque reticulatis paulo prominentibus; petiolo tenui, tereti, striato, glabro, limbo 4-plo brevior: racemo fructifero supra-axillari, petiolo paululo longiore; rachi crassa, patente, apice pedicellos 3 breves gerente; pedicellis drupis 3 majusculis oblongis longe stipitatis radiantibus

carnosis fusco-violaceis glabris instructis.—In Himalaya : *v. s. in herb. Hook.* ♀, Khasya, alt. 3000–4000 ped. (Hook. & Th.).

This is easily distinguished from the two following species by its oblong, stiff, coriaceous, shining, very pallid leaves, with the nerves and veins much sunk in the parenchyma, and covered beneath with a very pale glaucous bloom. The fructiferous plant only is known. The branch is  $1\frac{1}{2}$  line thick, with axils 1–2 inches apart; the leaves are 3– $3\frac{1}{4}$  inches long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch broad, with a rather long, constricted, canaliculated, reflexed summit, the petiole being 7 lines long. The fructiferous peduncle is  $\frac{3}{4}$ –1 inch long, bearing three pedicels 2–3 lines long, each swollen at its apex into a globular receptacle marked by the cicatrices of three fallen drupes. The drupe, putamen, and seed have already been fully described.

2. *Hæmatocarpus comptus*, nob.;—Bateria validum, nob. *Ann. Nat. Hist.* ser. 3. xiii. p. 124;—ramis teretibus, glaberrimis, tuberculatis, cortice pallido, rimoso; foliis anguste oblongis, imo subacutis, apice acuminatis, acumine recurvo et callosomucronato, e basi longe 3-nerviis, nervis cum aliis lateralibus utrinque 3 divaricatis intra marginem arcuatim nexis, venisque insigniter transversis prominentibus, valde reticulatis, glaberrimis, supra subnitentibus, pallidis, subtus concoloribus, marginibus cartilagineis reflexis; petiolo tenui, glabro, limbo 6-plo brevioribus; racemis ♂ supra-axillaribus, 2–4, fasciculatis, folio longioribus; ramis brevibus, flores 1–3 breviter pedicellatos gerentibus; sepalis 15, gradatim minoribus, exterioribus bracteiformibus, ternatim imbricatis, ovatis, glabris, cum marginibus membranaceis ciliatis; petalis 6, paulo minoribus, ovatis, crassioribus, fuscis, concavis, imo 2-glandulosis, 3 interioribus ad basin lobis 2 dentiformibus erectis munitis; staminibus 6, filamentis dilatatis, breviusculis, connectivo amplissimo, orbiculari, marginibus late membranaceis, galeatis, carina interna crassa; anthera 2-loba, lobis parvis sejunctis, infra medium dorso adnatis, hoc modo celatis; ovaris sterilibus 3, ovatis, erectis, filamentis æquilongis, stylo erecto apiculatis.—In Himalaya : *v. s. in herb. Hook.* Khasya (Griffiths); Sikhim (Hook. & Th.).

This is a species easily distinguishable from the preceding by its much narrower, oblong leaves, somewhat acute at both extremities, marked with prominent transverse veins and copious reticulation, and with shorter petioles. The leaves are  $2\frac{3}{4}$ –3 inches long,  $1\frac{1}{4}$ – $1\frac{3}{8}$  inch broad, on a slender petiole  $\frac{1}{2}$  inch long. The racemes are 4–5 inches long; their branches (3–4 lines

apart) are 4–6 lines long, and bear from one to three alternate flowers on pedicels 1 line long; the flowers are 1 line in diameter in the bud; they have generally fifteen sepals in ternary series, diminishing outwards, the external ones bracteiform; all are ovate, fuscous, marked with reddish dotted lines, and with a broadly hyaline border, glabrous but ciliated on the margins; the six petals are shorter than the sepals, oblong, fuscous, subfleshy in the middle, with two prominent glands near the bottom, the three inner ones with two erect tooth-like lobes at the base; six equal stamens, more than half the length of the petals, erect, in two imbricating series, with strap-shaped filaments, suddenly expanding into a wide, suborbicular, concave, hood-like connective, with a thick prominent ridge down the middle, the margins being broadly membranaceous; two small, subglobular, separate anther-lobes are dorsally affixed on each side of the ridge a little below the centre, which thus lie concealed by the broad membranaceous sides and hooding summit; the filaments are firmly agglutinated to a central receptacle, which supports three sterile ovate ovaries the length of the filaments, each with a terete erect style.

3. *Hæmatocarpus incusus*, nob.;—ramulis strictis, striolatis, pruinosis, obsolete tomentellis; foliis ovatis, imo rotundatis, apice repente constrictis, acumine brevi acuto et mucronato, imo 3-nerviis, nervis divaricatis, longe ultra medium protensis, et cum aliis superioribus utrinque 2–3 arcuatim nexis, planis, flaccidis, reticulatis, glaberrimis, supra obscure viridibus, opacis, sub lente corrugato-insculptis, nervis impressis, subtus nitidioribus, nervis prominulis; petiolo tenui, striato, glabro, apice ruguloso, limbo 5-plo brevior: racemis ♂ racemosis, in ramis aphyllis annotinis binis, folio 3-plo longioribus; rachi tenuissima; ramis subbrevibus, remotiusculis, bracteolatis, flores 3 breviter pedicellatos gerentibus; sepalis 15, exterioribus bracteiformibus, ternatim imbricatis, ovatis, venose pictis, marginibus late membranaceis et ciliatis; petalis 6, ellipticis, subacutis, carnosulis, guttatim lineolatis, marginibus membranaceis, apice denticuloso-erosis, 3 interioribus lobis 2 basalibus dentiformibus instructis; staminibus 6, filamentis brevioribus, connectivo oblongo, concavo, marginibus dilatato-membranaceis, dorso incurvo, carina externa obtusa fusca signato, antheræ lobis 2 sejunctis, majusculis, lateribus immersis, valde hyalinis, sutura marginali 2-valvatim hiantibus; ovarii sterilibus 3, oblongis, erectis, stylo apiculatis.—In Himalaya: *v. s. in herb. Hook.*, cum foliis, Sikhim (Hook. & Th.); floescens sine foliis, Khasya (Hook. & Th.).

I have placed together the above two specimens, one with leaves only, the other being a portion of a leafless branch with the racemes alone, both certainly appertaining to the genus, and which, as they are both from the Himalayan region, may be considered to belong to one another. At first, upon a hasty inspection, I regarded this as the ♂ plant of *H. Thomsoni*; but on a more careful comparison, I find they must be regarded as distinct. The leaves have quite a different aspect: they are broader, more regularly ovate, flaccid (not thick and coriaceous), flattened (not undulating and rigid), not canaliculated, have not the same shining surface, and are not covered beneath with a whitish pruinose hue; there is also some difference in their venation. The branch is straight, with cupular nodes in each axil  $\frac{1}{2}$ — $\frac{3}{4}$  inch apart; the leaves are  $2\frac{3}{4}$ — $3\frac{1}{2}$  inches long,  $1\frac{3}{4}$ — $2\frac{1}{4}$  inches broad, on a petiole 7–8 lines long. The inflorescence consists of two elongated axillary racemes growing out of an old leafless branch, the almost glabrous, striated, slender rachis being 6–7 inches long, with numerous branchlets 3–6 lines apart, 4 lines long, each bearing three flowers upon pedicels 1 line long; the fifteen sepals, in ternary imbricating series gradually decreasing in size, are glabrous, with ciliated margins; they are all oval, fuscous, and veined with reddish somewhat interrupted lines; the petals, nearly the size of the inner sepals, are oblong, subacute, marked longitudinally with red, glandular, dotted lines, the three interior being somewhat smaller and furnished at their base with two small, auricular, dentiform lobes; the six stamens are firmly attached to a short central receptacle that supports the ovaries; they are little more than half the size of the petals; the short unguiform filament, only a quarter of their entire length, suddenly expands into an oblong, concave, very membranaceous connective, marked by a thick, dark, prominent ridge down the middle; the anther-lobes are larger and more widely separated than in the preceding species, are quite marginal, hyaline, and burst on the external edge by a longitudinal fissure; the ovaries are longer than the filaments, and are terminated by an erect style.

#### 45. PACHYGONE.

The existence of several genera among Menispermaceæ with exalbuminous seeds was not known to botanists until I first indicated the fact in this genus, which was established in 1851; for it was then doubtful whether the genus *Spirospermum* really belonged to the family. Gaertner, however, in 1791, figured a seed, called by him *Koon Zeylanicus*, which no one

had recognized, though Schreber had erroneously referred it to *Ochna*. At the time above mentioned I defined several genera whose seeds were destitute of albumen, which I classed with this genus in a distinct tribe: in this list some errors existed, owing to want of sufficient materials; but among the many genera that are still valid is *Pachygone*, the type of which is *Cocculus Plukenettii*, DC. The authors of the 'Flora Indica' and of the 'Genera Plantarum' fully acknowledged this genus, confined, as I had proposed it, to plants of Asiatic origin; but Dr. Eichler, in his monograph of the Brazilian *Menispermaceæ*, has quite misunderstood the structure of *Pachygone* in amalgamating with it the South-American genus *Hyperbæna*. He has suppressed the many species I have particularized of the latter genus, making of them two species of *Pachygone*, establishing as a third species a Columbian plant which also belongs to *Hyperbæna*. Misapprehensions of this nature are to be regretted, because they make confusion and create many useless synonyms. The genus may easily be distinguished from *Hyperbæna* by the shape of its petals and of its stamens, by its more osseous putamen having a cochleiform condyle with external apertures, by the shape of its seed, by the general habit of the plants, and more especially by the venation of its leaves, which is always a character of primary importance. In its floral structure, both ♂ and ♀, there is scarcely any difference between it and *Cocculus*; and in the shape of its osseous putamen, as well as in its condyle, there is a great resemblance.

PACHYGONE, nob.—*Flores* dioici. *Masc. Sepala* 6, alternatim disposita, interiora majora, obovata, submembranacea, concava, apice eroso-denticulata, æstivatione imbricata. *Petala* 6, sepalis interioribus minora, oblonga, concava, apice incurva, rotundata et denticulata, imo 2-auriculata, lobis crassis, filamentum amplectentibus. *Stamina* 6, petalis opposita, et ad unguem iis affixa; *filamenta* 6, libera, æqualia, tenuia, apice vix crassiora, petalis subbrevia; *antheræ* globoso-4-lobæ, subpeltatim affixæ, 2-loculares, utrinque rima transversali 2-valvatim dehiscentes. *Ovaria rudimentaria* 3, punctiformia.—*Fœm. Sepala* et *petala* ut in masc. *Stamina sterilia* 6, petalorum dimidia longitudine, iis opposita. *Ovaria* 3, gibboso-ovata, glabra, gynæcio centrali insita, 1-locularia, *ovulo* unico facie interna appenso. *Stylus* brevissimus, excentricus, subito incurvus. *Stigma* teres, breve, horizontale, superne subsulcatum. *Drupæ* 3, ovatæ, carnosæ, stigmatem persistente basin versus signatæ; *putamen* osseum, reniformi-orbiculatum, subcompressum, utrinque interrupte et curvate sulcatum; *condylus* internus, excentralis, sub-

cochleiformis, locellis parvis 2-cameratus, utrinque foramine angustissime lunato extus perforatus. *Semen* loculum implens, cyclice curvatum, extus convexum, intus subconcaevum; *integumentum* membranaceum, tenue, *chalaza* incrassata *raphe* que prominente ad condylum affixum: *embryo* omnino exalbuminosus, cyclicus, *cotyledonibus* magnis, crassis, accumbentibus, *radicula* parva brevissima supera et ad stylum basalem spectante multoties longioribus.

Frutices in *Asia intertropica et insulis scandentes*; folia ovata vel oblonga, sæpius glabriuscula, petiolata; racemi simplices, extra-axillares, subpubescentes.

1. *Pachygone Plukenettii*, nob. Ann. Nat. Hist. ser. 2. vii. 43;—*Pachygone ovata*, Hook. & Th. (in parte), Fl. Ind. i. 203;—*Cocculus Plukenettii*, DC. Syst. i. 520, Prodr. i. 97; *Wight*, Icon. tab. 824, 825;—*Cocculus Wightianus*, Wall. Cat. 4959;—*Cocculus officinarum*, Pluk. (non Bauh.) Alm. 43; *Mant.* 52, tab. 345. fig. 7;—*Koon Zeylanicus*, Gaertn. ii. 486, tab. 180. f. 11;—alte scandens, ramosissima; ramulis junioribus puberulis, demum glabris et cinerascentibus, substriatis; foliis ovatis, imo late obtusis aut paulo cordatis, junioribus rotundioribus, a medio sursum curvatim angustioribus, apice rotundatis, emarginatis aut subacutis, imo 5-nerviis, subcoriaceis, supra opace viridibus, tenuissime reticulatis, subtus pallidioribus, nervis tenuibus, paulo prominulis, marginibus tenuiter cartilagineis; petiolo tenui, subglabro, apice crassiusculo et puberulo, limbo dimidio vel triplo brevior: panicula ♂ axillari, racemiformi, puberula, folio paulo brevior vel æquilonga; rachi tenui, flexuosa; ramis alternis, brevissimis, bracteolatis, pedicellis 1–3 alternis, imo bracteolatis, 1-floris munitis: racemo ♀ axillari, puberulo, folio paulo brevior, rachi validiore; pedicellis 3, alternis, subremotis, brevibus, 1-floris, fructiferis longioribus; in flore ovarii 3; drupis abortu sæpius solitariis, glabris, purpureis.—In India orientali: v. s. in herb. variis, penins., ♂ & ♀ (Wall. Cat. 4958, *Wight*, 48, 49); in herb. Hook., Ceylon (*Thwaites*, 1057); in herb. De Cand., penins. (*Leschenault*).

Under the above numbers there are several plants that will perhaps some day be separated from this typical species, which, as above enumerated, includes many different forms: in some the leaves are pale, of larger size, and cordate at base; often they are regularly oval, frequently are darker and rigidly coriaceous, sometimes smaller, broadly ovate, upon longer and more slender petioles; and this last form will probably constitute a distinct species, as well as another with oblong acute leaves. The leaves are  $1\frac{1}{4}$ – $2\frac{3}{4}$  inches long,  $1\frac{1}{8}$ – $2\frac{1}{4}$  inches broad, on a



petiole 5–10 lines long. The ♂ racemose panicle is 1–4 inches long, its branches (2 lines long) bearing three alternate, very shortly pedicellated flowers; the flower has a ciliated bract at base, three oval outer sepals, three inner obovate somewhat larger, all with membranaceous erose margins, six oblong petals half their size, with a denticulated apex and two lateral basal inflected lobes. The ♀ flower has similar sepals and petals, six anantherous stamens, and three glabrous ovaries, with a simple reflected excentric style; in the fruit the fleshy cotyledons are generally unequal in size.

2. *Pachygone ovata*, nob., Hook. & Th. in parte, *Fl. Ind.* i. 203;—*Cissampelos ovata*, *Poir. Dict.* v. 11; *DC. Syst.* i. 537, *Prodr.* i. 102;—foliis ovalibus, utrinque obtusis, mucronatis, imo 5-nerviis, utraque facie concoloribus et pallidis, coriaceis, supra glabris, reticulatis, in nervis prominulis interdum parce pilosis, sæpius omnino glabris; petiolo tenui, limbo triplo brevior, pubescente: racemis ♂ supra-axillaribus, solitariis, puberulis, petiolo subæquilongis vel folio paulo brevioribus; rachi flexuosa, axillis approximatis, bracteolatis, floribus 2–3 breviter pedicellatis munitis; sepalis glabris.—In India orientali: *v. s. in herb. variis*, penins. Ind. (Hook. & Th.).

A species remarkable for its smaller, paler, and more oval leaves, and its simple racemose (not paniculated) inflorescence. The leaves are  $1\frac{1}{4}$ –2 inches long, 11–15 lines broad, on a petiole 5–7 lines long; the racemes are  $1\frac{1}{2}$  inch long, with somewhat approximated axils, each with a lanceolate very pilose bract,  $1\frac{1}{2}$  line long, from which two or three pedicellated flowers arise; the flowers have six sepals, in two series, all membranaceous and marked with very close interrupted dotted lines; the outer series have a few scattered hairs or are quite glabrous; the three inner ones are ovate, very concave, erosely denticulated at the summit; the petals are small, subfleshy, emarginate at the apex, minutely punctulate, normally six, embracing as many stamens; but sometimes one petal is wanting, but not the stamens, and sometimes there are seven stamens without a corresponding petal. The drupe is of the same size and form as in the preceding species; the putamen is reniform, with a rugous surface; the external indication of the internal condyle is almost obliterated; the cotyledons are somewhat unequal in size.

3. *Pachygone concinna*, nob.;—ramulis substrictis, tenuibus, striatis, glaucis; foliis ellipticis, utrinque subacutis, cuspidato-mucronatis, e basi nervis 3 cum nervis lateralibus utrinque 4–6 arcuatim nexis, marginibus integris, undulato-crispatis, utrinque glaberrimis, supra viridibus, subtus paulo

pallidioribus, reticulatis, nervis tenuissimis, vix prominulis, costa basin versus puberula; petiolo tenuissimo, adpresse pubescente, limbo 3-4-plo brevior: racemis ♂ axillaribus, elongatis; rachi rectiuscula, subadscendente, folio 5-plo longiore, spicatum racemiformi; axillis bracteolatis, floribus 1-3 fasciculatis breviter pedicellatis munitis; sepalis 6, quorum 3 interiora duplo majora, suborbicularibus, concavis, valde imbricatis, marginibus membranaceis eroso-denticulatis, pruinoso-punctulatis; petalis 6, oblongis, versus basin lobis 2 glandulæformibus inflectis munitis; staminibus 6; ovariis rudimentariis 3.—In India orientali: *v. s. in herb. Hook.*, Courtallam, ♂ (Thwaites).

This is distinct from all the preceding species, and is nearest *P. ovata*, but differs in its leaves being acute at both extremities, almost membranaceous in texture, upon an almost filiform petiole, in its very elongated spicated inflorescence, with alternate axils which are 1-3-flowered, bracteated, the bracts sometimes petiolated and assuming the form of the leaf, and in its rugulose glaucous sepals. The leaves are  $1\frac{3}{4}$  inch long,  $\frac{3}{4}$ -1 inch broad, on a petiole 6 lines long. The rachis of the inflorescence is straight, very slender, 6-7 inches long, its axils 2 or 3 lines apart, furnished with a pilose setaceous bract 1 line long, which is sometimes replaced by a pilose leaflet acute at both extremities, 2 lines long,  $1\frac{1}{2}$  line broad, on a petiolule 1 line long, and a cuspidate point  $\frac{1}{2}$  line long: out of each axil spring one to four flowers upon pedicels 1 line long; the sepals are very pale, with a remarkably shagreened surface, and are nearly orbicular.

†. *Pachygone adversa*, nob.;—*Pachygone ovata*, *H. & Th.* (*in parte*) *Fl. Ind.* i. 203;—ramulis virgatis, teretibus, pubescentibus; foliis trapeziformi-oblongis, imo 2-sinuato-obtusissimis et fere truncatis, angulis rotundatis, sursum gradatim angustioribus, apice obtusis et calloso-mucronatis, rarius acutiusculis, e basi 5-nerviis, nervis extus ramosis, membranaceis, supra subnitidis, dense viridibus, glabris, valde reticulatis, subtus brunneo-glaucis, pubescentibus, marginibus subrevolutis; petiolo subtenui, ferrugineo-pubescente, limbo 4-plo brevior: racemo ♂ supra-axillari, solitario, racemiformi, laxo spicato, adscendente, folio æquilongo, pubescente; rachi rectiuscula, axillis alternis minime bracteolatis, floribus 3 brevissime pedicellatis fasciculatis munitis; pedicellis bracteolisque puberulis; floribus fere glabris.—In Ceylonia: *v. s. in herb. Hook.*, Ceylon (Thwaites, 1054).

A species remarkable for the dilated base of its leaves and its

elongated inflorescence. The leaves are  $2\frac{1}{4}$ – $2\frac{1}{2}$  inches long,  $1\frac{1}{8}$ – $1\frac{1}{4}$  inch broad at their base, on a petiole 6–7 lines long; the slender raceme-like inflorescence is  $2\frac{1}{2}$ –3 inches long, with axils 1–4 lines apart, pubescent; the setaceous bracteoles are 1 line long, from which issue one to three pedicellated flowers; pedicels  $\frac{3}{4}$  line long; flowers, before expansion,  $\frac{1}{2}$  line in diameter; three outer sepals acutely elliptic, fuscous, glabrous, with ciliated margins; three inner sepals somewhat longer, nearly orbicular, opaque, glabrous, with membranaceous erosely denticulated margins; petals 6, acutely elliptic, length of outer sepals, thick, fleshy, shortly inflected around the claw; stamens six, of equal length; three sterile rudimentary ovaries.

5. *Pachygone hebephyllus*, nob.;—ramulis virgatis, teretibus, pubescentibus; foliis ovato-oblongis, imo obtusis vel rotundatis, apice vix acutis et mucronatis, e basi 5-nerviis, subflaccidis, supra glabris aut nervis subpuberulis, delicatule reticulatis, subtus pallidioribus, mollissime flavido-puberulis; petiolo tenuissimo, limbo dimidio vel paulo brevior, flavide tomentello: panicula ♂ axillari, petiolo subæquilonga, pubescente, alternatim ramosa; ramis brevibus, imo bracteolatis, alternatim 3–4-floris; pedicellis imo bracteolatis; sepalis 6, biseriatis, exterioribus oblongis, pilosulis, interioribus duplo majoribus, orbiculatis, concavis, fuscis, membranaceis, glabris; petalis 6, brevioribus, late ovatis, imo cuneatis, marginibus infra medium introflexis, fuscis, glabris; staminibus 6, petalis æquilongis.—In Java: *v. s. in herb. Hook.* ♂, Java (Horsfield, 304), *in herb. Mus. Brit.* ♂, Java (Horsfield).

A species differing from all the preceding in its very soft tomentose leaves. The branches are very slender and straight, the leaves soft and flaccid,  $1\frac{3}{4}$ – $2\frac{1}{4}$  inches long,  $1\frac{1}{8}$ – $1\frac{3}{8}$  inch broad, on a very slender petiole 10–12 lines long. The ♂ panicle is  $\frac{3}{4}$ – $1\frac{1}{4}$  inch long; the rachis and bracteoles fulvo-pubescent; the flowers minute; the petals have the inflected auricular lobes placed a little below their middle.

6. *Pachygone odorifera*, nob.;—valde ramosa, ramulis longissimis, dependentibus, teretibus, substriatis, glabris; foliis oblongis, imo rotundatis vel obtusulis, apice obtusiusculis, calloso-mucronulatis, e basi 3–5-nerviis, utrinque glaberrimis, fusco-viridibus et concoloribus, supra nitentibus, nervis venisque reticulatis et subimmersis, subtus lævissimis, costa mediana prominente, nervis primariis vix prominulis, marginibus integris, undulatis; petiolo tenui, tereti, glabro, apice basi-que paulo tumidulo, limbo 5-plo brevior: racemo ♂ e pulvino rufo-piloso supra-axillari orto, folio longiore; rachi gracili, pu-

berula; ramis spicatum alternis, brevissimis, imo bracteolatis, apice flores 1-3 sessiles gerentibus; floribus parvis, odoriferis; sepalis 6, obovatis, glabris; petalis 6, obovatis, imo lobis minimis introflexis; staminibus 6, filamentis tenuibus; antheris sub-4-lobis: racemo ♀ supra-axillari, folio æquilongum; rachi subvalida, pubescente; pedicellis alternis, longiusculis, divaricatis, imo bracteatis, 1-floris; drupa piso majore, putamine reniformi-compresso, spinuloso-tuberculato, condylo utrinque depresso, lunato.—In Tenasserim: *v. s. in herb. Hook.* ♂ et ♀, Moulmein (Parish, 276); *in herb. Mus. Brit.* ♂ (Roxburgh).

“A large spreading shrub, growing on limestone rocks, with long drooping branches covered with a profusion of small white flowers, which scent the air far round, smelling of honey; it affords flowers and fruit at the same time.” This is a very distinct species, remarkable for its glabrous, dark leaves, polished on both sides, with nearly immersed nerves and veins; the leaves are  $2\frac{3}{4}$ – $3\frac{3}{4}$  inches long,  $1\frac{3}{8}$ – $1\frac{5}{8}$  inch wide, on a petiole 6–9 lines long. The ♂ raceme is  $3\frac{1}{2}$ – $5\frac{1}{2}$  inches long, the alternate branchlets are 1 line long; the ♀ raceme is 5 inches long, the divaricated pedicels are 2–6 lines long; the putamen is 5 lines long,  $4\frac{1}{2}$  lines broad.

In the British Museum is a specimen which appears to me conspecific with the plants from Moulmein: the leaves are similar in size and shape, equally polished, and on a petiole of equal length; but they are of darker hue: the ♂ raceme is of similar length, and the floral structure in no way different. I have therefore considered it identical. On the label is written, in Dr. Buchanan's handwriting, “novum genus a Roxburghio Ziga Mushadie dictum, Tourrougmozeila,” which we may infer is its locality; but where that is I cannot learn.

7. *Pachygone brachystachys*, nob.; — *Cocculus brachystachys*, DC. *Syst.* i. 528, *Prodr.* i. 99;—ramulis vix scandentibus, teretibus, glabris, junioribus flavo-tomentosis; foliis late ovatis, imo rotundiusculis vel subtruncatis, a medio sensim angustatis, apice acutis et calloso-mucronatis, imo 5-nerviis, coriaceis, utrinque glaberrimis et pallidis, supra nitidis, in nervis sulcatis, subtus glaucis, nervis prominulis, eveniis, sed ob reticulationem minutissimam subimmersam impresso-punctulatis; petiolo tenui, glabro, limbo dimidio brevior: racemo ♀ supra-axillari, rachi ferrugineo-tomentosa, petiolum æquante; pedicellis alternis, brevibus, 1-floris, imo bracteolatis: drupis 1–3, nitidis; putamine cochleato-reniformi, liturato-sulcato, ad condylum lunatim insculpto.—In insula Timor: *v. s. in herb. Lindley*, Timor (ex hb. Mus. Paris.).

The internodes are about  $\frac{1}{2}$  inch long; the leaves are  $2\frac{1}{2}$

inches long, 2 inches broad, on a petiole  $1\frac{1}{4}$  inch long; the fructiferous raceme is  $1-1\frac{1}{2}$  inch long, the slender pedicels  $1\frac{1}{2}$  line long, the drupe 4 lines in diameter; the seed is cyclohippocrepiform and exalbuminous, the cotyledons being large and fleshy, with a very small superior radicle.

8. *Pachygone leptostachys*, nob.;—*Cocculus leptostachys*, DC. *Syst.* i. 528, *Prodr.* i. 99;—ramulis erectis (?), teretibus, gracilibus, glabris, junioribus velutinis; foliis ovalibus, acuminatis, mucronatis, imo 3-nerviis, utrinque glabris, pallide viridibus et fere glaucis; petiolo tereti, patente, limbo æquilongo: racemo ♀ axillari, gracili, folium æquante aut longiore; rachi tenui, pubescente; pedicellis alternis aut subfasciculatis, brevibus, 1-floris.—In ins. Timor.

I have not seen this plant, which seems specifically distinct from the preceding species, differing in its leaves being more oval, very much smaller in size, and with comparatively longer petioles. From the description above quoted, the leaves are oval and acuminate, 1 inch long, upon a petiole of equal length. The axillary racemes are 2 inches or more long, somewhat like that of the preceding species; but the pedicels are so close as to appear sometimes fasciculated.

#### 46. PLEOGYNE.

This genus was proposed by me in 1851 (*Ann. Nat. Hist.* ser. 2. vii. 43) for an Australian plant of Cunningham's collection. With a habit resembling that of a *Pachygone*, it has oblong, coriaceous leaves with about five pairs of alternate nerves, which are arcuately connected together, with prominent reticulations; they have very short petioles: it has a fructiferous axillary raceme, less than half the length of the leaf. In the only specimen I have seen, the floral envelopes had fallen away; but Cunningham has noted upon it that the flower consists of three sepals, six stamens, and six ovaries: the ovaries which I have seen are seated in a single series upon a raised hairy receptacle; they are gibbously oval, very pilose, terminated by as many curving, somewhat erect, subulate styles, all connivent in the centre. The drupes are very small, pubescent, gibbously oval, subfleshy; each has a somewhat coriaceous putamen, with a small, internal, rounded condyle, and contains an exalbuminous seed, with large, fleshy, lunately curved, accumbent cotyledons, and a small superior radicle inclining towards the remnant of the style, which is not far from the point of attachment of the fruit: this structure is quite that of *Pachygone*.

Mr. Bentham, in 1862, established his genus *Microclisia* (Nov. Gen. i. 435) upon an Australian plant very similar in its aspect to Cunningham's species; but he afterwards cancelled this (Flor. Austr. i. 59), making his plant not only congeneric, but specifically identical with Cunningham's plant. They are certainly very much alike, especially in the venation of the leaves; but in one case these are more acuminate. There is, however, this difference between the plants:—that in the former the flowers have eighteen sepals and six petals; in the latter, Cunningham only mentions the existence of three sepals, without any allusion to the presence of petals: the three interior sepals in *Microclisia* are long, acute, and almost lanceolate; in *Pleogyne* they are short and triangular. In *Microclisia* there are only three stamens, corresponding with the number of the ovaries; in *Pleogyne* there are six stamens, according with the number of the ovaries.

It may be urged that Cunningham overlooked fifteen of the smaller sepals, and did not notice the presence of the petals, on account of their minute size; but we have no right to assume this as a fact, and, upon that assumption, affirm the identity of the two genera. We have this consideration in favour of Cunningham's statement: if the calyx had consisted of the number of sepals found in *Microclisia*, we ought to see on the summit of the pedicel as many cicatrices, in six alternate series, at the spots from which they had fallen; but we find no such indications; the turbinated, thickened apex of the pedicel, forming a broad torus, is covered with hairs externally, and on its sharp margin we see only interrupted spaces (the cicatrices of the three larger sepals, and the spots where the three small bracteform sepals have been fixed): had there been twelve other sepals exterior to these, the points of their attachment ought to be visible. Additional evidence is afforded by the circumstance that I found in one of the withered flowers examined a triangular sepal pilose outside, and another extremely minute and less than half its size; so that I conclude the calyx must really consist of six sepals in two alternate series, the outer one of which was either not noticed by Cunningham or considered by him to consist of minute bracts. Among the hairs of the gynæcium, between two of the ovaries, I found a process very like a sterile stamen; it was slender, glabrous, with two separated glands on its apex. We may also notice the fact mentioned by Mr. Bentham, that in *Microclisia* he found only three carpels, while in Cunningham's plant we perceive constantly six or more; he also adds that, in his genus, the thick fleshy cotyledons are nearly conferruminate, and the radicle is scarcely distinguishable. I did not find this to be the case in *Pleogyne*, where the cotyledons are

quite distinct, flat, subfoliaceous, and the conical radicle is well developed.

In the view of these facts, I have regarded *Microclisia* as distinct from *Pleogyne*—a conclusion strengthened by the great difference in the geographical distribution of the plants, which are found at two opposite sides of the Australian continent.

PLEOGYNE, nob.—*Flores* dioici. *Masc.* ignoti.—*Frœm.* *Sepala* 6 in ordine ternario alternatim disposita, triangularia, acuta, extus valde pilosa, exteriora minutissima, interiora duplo majora. *Petala* invisæ aut nulla. *Stamina sterilia* 6, minuta. *Ovaria* 6 (vel interdum 7), gibboso-ovata, lateribus valde compressa, in stylum oblique attenuata, sericeo pilosa, gynæcio piloso crebriter insita, 1-locularia, *ovulo* solitario, angulo interno appenso. *Styli* totidem, simplices, longiusculi, subulati, glabri, acuti, subdeflexi, dein curvatim adscendentes et in centrum conniventes. *Drupæ* 6 vel abortu pauciores, gibboso-ovata, subcompressæ, pilosæ, styli vestigio pedicello proximo notatæ; *putamen* (vix maturum) reniformi-ovatum, valde compressum, 1-loculare; *condylus* internus, sinum versus intrusus, parvus, subglobosus. *Semen* loculum implens, lunatum; *integumentum* membranaceum, condylo affixum: *embryo* exalbuminosus, *cotyledonibus* amplis, valde compressis, crasso-carnosis, accumbentibus, falcatis, *radicula* parva supera ad stylum fere basalem spectante multoties majoribus.

Frutex *Australiæ septentrionalis scandens*; ramuli *teneri, teretes, pubescentes*; folia *obovata, coriacea, nervosa, reticulata, subglabra, subtus pubescentia, petiolata*: racemi ♀ *axillares, solitarii, pilosuli, folio breviores, pauciflori*.

*Pleogyne Cunninghamsi*, nob., in Ann. Nat. Hist. ser. 2. vii. 43;—ramulis teneris, teretibus, pubescentibus; foliis obovatis, imo rotundatis vel obtusioribus, apice acutiusculis et mucronatis, reticulatis, nervis prominulis, inter se arcuatim nexis, margine cartilagineo prominulo, coriaceis, utrinque pallidis, supra nitentibus, subglabris, aut in nervis puberulis, subtus cano-pubescentibus; petiolo tortuoso, tomentosio, limbo 5-plo brevioribus; racemis ♀ axillaribus, solitariis, tomentosio, folio brevioribus; floribus paucis, minutis, pedicellatis; drupis 6 vel abortu paucioribus, pubescentibus, pisi minoris mole.—In Australia boreali: *v. s. in herb. Heward, Cambridge Gulf (A. Cunningham, 1819)*.

This is a very arid-looking plant, with short flexuous branchlets and rigid leaves of a yellowish hue, somewhat polished, very reticulated, 2–2½ inches long, 1–1½ inch broad, on a curving petiole 4–6 lines long; the rachis of the ♀ raceme is ½–1 inch

long, bearing one to three pedicellated flowers; in two of the flowers examined I found seven ovaries; but Cunningham states their number to be six, accompanied by as many sterile stamens, and surrounded by three sepals, no mention being made of any petals.

#### 47. MICROCLISIA.

This genus was made known, in the addenda to the new 'Genera Plantarum' (vol. i. p. 435), by Mr. Bentham, who founded it upon an Australian plant from Moreton Bay; this I have lately seen, and here give the results of my examination, which somewhat differ from the details afforded by that distinguished botanist. In his 'Flora Australis' (p. 59), published since that period, Mr. Bentham has considered his genus to be the same as my *Pleogyne*, the ♂ plant of one and the ♀ of the other forming one species. I have seen Mr. Bentham's typical plant in the Hookerian herbarium, from the collection of Dr. Mueller; but after attentive examination, on account of the disparity in the number of sepals, I cannot believe in their identity—an opinion strengthened by remembering that in one genus there are three stamens, in the other six, and considering also the great distance of their localities, in nearly opposite sides of that vast continent. As far as can be judged from the evidence now existing, it appears to me that *Microclisia* should be held distinct, till we have better proof of their identity. The genus is near his African genus *Trichlisia*, agreeing in the more elongated form of the three interior sepals, with valvate or introflexed æstivation; but it differs in having its three stamens quite free to the base, with anthers of different construction connivent in the centre, and in the presence of six petals: it also differs in the greater number of its sepals, which Mr. Bentham states at eight or nine, while I find them to be eighteen in ternary series, all of bract-like proportions, except the inner series, and closely imbricated on the summit of the pedicel; while *Trichlisia* has no petals, or only rudiments of them. All the sepals are acute, submembranous, pellucidly punctate. The petals, externally fixed by their claw to the andrœcium around the base of the filaments, are half their length, and a quarter of that of the inner sepals; they are cuneately oval or subrhomboid, concave, submembranaceous, pale, pellucid-punctate, with two prominent fleshy glands on the sides, a little below the middle. The three filaments are attached by the slender base to the andrœcium, become gradually thicker upwards, incurved at their summit, where they terminate in an oval clavate connective; they are generally clothed with long soft hairs, sometimes becoming



glabrous; the anther-cells are oval, widely separated, and laterally imbedded in the fleshy connective, bursting by an oblique suture.

**MICROCLISIA**, Bentham.—*Flores* dioici. *Masc.* *Sepala* 15, imbricatim et ternatim disposita, quorum 12 minima, triangularia, bracteiformia, extus gradatim paululo minor, 3 interiora reliquis 4-6-plo longiora, lanceolato-oblonga, subacuta, æstivatione subvalvata, cum marginibus involutis, apice demum patentim reflexo. *Petala* 6, biseriata, sepalis dimidio breviora, imo cuneato-unguiculata, limbo suborbiculato, marginibus subcrenatis et subinvolutis, glandulis 2 carnosulis irregularibus notata, subpellucido-punctata, glabra. *Stamina* 3, centralia, libera, petalis paulo longiora; *filamenta* teretia, incurvatim erecta; *anthera* subglobosæ, sub-4-lobæ, 2-loculares, dorso affixæ, introrsæ, utrinque transversim et 2-valvatim dehiscentes.—*Fl. Fem.* ignoti. *Drupa* 3, reniformi-globosæ, stylo persistente basin versus notatæ; *putamen* conforme, 1-loculare; *condylus* omnino internus, umboniformis, parvus, sinu ventrali adversus. *Semen* loculum implens, condylo affixum, exalbuminosum: *embryo cotyledonibus* magnis, crassis, subcurvatis, fere conferruminatis, *radicula* minima, vix distincta.

*Frutex Australasiæ orientalis, scandens*: ramuli *pubescentes*; folia *oblonga, subcoriacea, e basi 3-nervia, reticulata, subtus pubescentia, petiolata*: racemi ♂ *axillares*.

*Microclisia Australis*, Benth. Nov. Gen. i. 436;—*Pleogyne Australis*, Benth. *Fl. Austr.* i. 59;—ramulis teretibus, striatis, subglabris, junioribus puberulis; foliis lanceolato-oblongis vel oblongis, imo rotundatis vel valde obtusis, ultra medium sensim acuminatis, apice obtusulo et mucronulato, e basi 3-nerviis, pinnatim et arcuatim nervosis, supra viridibus, valde reticulatis, glabris, vel in nervis tantum puberulis, subtus dense cinereo-tomentosis, nervis paulo prominulis; petiolo tenui, apice crassiore, pubescente, limbo 7-plo brevior: panicula ♂ axillari, petiolo 3-plo longiore, pubescente, ramis paucis, 1-3-floris, vel e ramulo novello aphylo paucibracteato, paniculam ramosam elongatam mentiente, bractea foliiformi brevi; sepalis 15, extus pilosulis; petalis 6, quorum 3 interiora staminibus opposita paulo majora, sepalis interioribus 6-plo brevioribus, glabris, pellucido-punctulatis, pallidis, glandula utroque latere signatis; staminibus 3, petalis 2-plo longioribus.—In Australia orientali: *v. s. in herb. Hook.*, Moreton Bay and Fitzroy Range (F. Müller), Moreton Bay (Oldham).

The leaves are  $2\frac{3}{4}$ – $3\frac{1}{4}$  inches long,  $1\frac{1}{4}$ – $1\frac{3}{4}$  inch broad, on a petiole 4–5 lines long.

#### 48. SCIADOTENIA.

This very interesting genus was proposed by me in 1851, the typical species being a Cayenne plant, remarkable for the peculiar development of its fruit. The plant has much the habit of *Elissarrhena* or *Anelasma*, having large polished leaves with five elongated nerves springing from the base, which form only a small angle with the midrib and are therefore somewhat parallel, all arcuately anastomosing with two superior pairs of shorter lateral nerves, and all connected by many straight transversely parallel veins. The petiole is slender and not exceeding one-fourth or one-fifth of the length of the leaf. The inflorescence is axillary and borne upon a single very elongated peduncle, as long as, or longer than, the leaf. At the period above mentioned I had seen only a solitary specimen, in which all the floral envelopes had fallen away, leaving no indication of their position; the summit of the peduncle bore nine immature drupes, each supported by its own long apparent pedicel; so that I then naturally concluded that the inflorescence was umbellate, each pedicel bearing its fruit. Shortly after the printing of my paper, I met with another specimen with more mature seeds; and in one of its axils I observed, to my surprise, eight ovaria sessile on the summit of the peduncle, and a single seed borne upon a lengthened pedicel-like support, as in the case before mentioned: this at once afforded a key to the real structure, making it evident that the supposed umbel is a development proceeding from a single flower. Ten years subsequently Mr. Bentham noticed the same fact (Proc. Linn. Soc. v. Suppl. 51), and explained this development as a separate growth of each ovary, considering each support to be a "podocarp"—that is to say, an expansion of the fruit or ovary. But this is not the case: its true nature was shown in my explanation of the analogous growth in *Tiliacora* (*suprà*, p. 74), where the clavate torus spreads into many short forks, which vary from three to twelve, according to the number of drupes perfected. In that genus these forks do not exceed the length of the torus (2 lines); and they are not united at the base, as in the very elongated carpophora of *Sciadotenia*, which are nearly an inch long, in shape like a 4-angular, 8-grooved puberulous pedicel, and united at the base inside by a membranaceous web, leaving a hollow space in the centre. The number of these supports corresponds with that of the ovaries perfected; they are prolonged in the ratio of the growth of the fruit, and are wholly suppressed whenever the ovary is

not fertilized. Each drupe has its own peculiar fleshy carpodium, by which it is attached and articulated upon the summit of the long carpophorum; but the latter is in no degree articulated with the torus, being evidently a growth of its substance.

Mr. Bentham describes the female flower, which he had seen, as having nine sepals in three series, those of the inner whorl being much larger; it had no petals; no mention is made of staminodia; and the ovaries are said to be from nine to twelve (I think I have seen as many as sixteen), all in a single whorl; they are pubescent and seated upon an elevated gynæcium; the style, rising excentrically from the inner angle, is subulate, channelled above, and somewhat reflected over the summit of the ovary. The drupe is somewhat puberulous, very fleshy, reniformly globose, with the remnant of the style below the middle of the side facing the axis; the putamen consists of a thin coriaceous shell, reniformly oval, subcompressed, with a rather deep sinus on the ventral side, where it is somewhat thickened, forming an obsolete condyle, which intrudes a short way within the cell, where it is convex, and to which the integument of the seed is attached: the embryo, which fills the cavity of the cell, is exalbuminous, lunate in shape, the cotyledons being accumbent, very thick and fleshy, conjoined at their upper extremity by a minute conical radicle, which points to the vestige of the style.

From the foregoing evidence it is clear that the genus *Sciadotenia*, of which the female flower only is known, belongs to the *Pachygoneæ*, and offers some analogy with *Pleogyne* in having an unusual number of pubescent ovaries arranged in a single whorl upon a raised gynæcium. Whether *Elissarrhena* has any relationship with it cannot be known till its female flower or fruit be discovered; but it is worthy of note that both are from Guiana, and that their branches are fistulous and filled with pith.

SCIADOTENIA, nob.—*Flores* dioici. *Masc.* ignoti.—*Fœm.* *Sepala* 9, in ordine ternario disposita, gradatim minora, exteriora bracteiformia, interiora intermediis 2-plo majora. *Petala* nulla. *Ovaria* 8 ad 16, gibba, uniserialiter supra gynæcium paulo elevatum insita, 1-ocularia, 1-ovulata. *Stylus* excentricus, angulo interiore ortus, supra ovarium inflexus, subulatus, superne sulcatus. *Drupæ* 9 vel abortu pauciores, gibboso-ovatæ, paulo compressæ, carnosæ, *carpopodio* carnosio breviter stipitatæ et singulatim ad carpophorum proprium articulatæ: *carpophora* tot quot drupæ, sub-4-gona, 8-sulcata, puberula, elongata, e toro orta, suberecta, umbellam mentientia,

intus in tubum membranaceum imo coalita, persistentia; *putamen* reniformi-ovatum, paulo compressum, tenuiter coriaceum, 1-loculare; *condylus* subobsoletus, lateralis, intra loculum intrusus, convexus, paululo incrassatus et placentaris. *Semen* loculo conforme, lunatum; *integumentum* membranaceum, *chalaza* laterali ad condylum affixum: *embryo* exalbuminosus, *cotyledonibus* magnis, crassis, incurvis, accumbentibus, *radicula* minima supera ad stylum spectante multoties longioribus.

Frutices *Guianenses*, *scandentes*; folia *elliptica*, *apice attenuata*, 5-nervia, *nervis rectis*, *subparallelis*, *intra marginem arcuatim nexis*, *transversim venosa et reticulata*, *utrinque glabra et nitentia*, *petiolo subbrevis*: pedunculus ♀ *supra-axillaris*, *solitarius* (vel e ramulo novello brevissimo plures approximati), *folio æquilongus vel longior*, *suberectus*, *ebracteatus*, *apice 1-florus*, *tomentosus*: *flos parvus*.

1. *Sciadotenia Cayennensis*, nob., in Ann. Nat. Hist. ser. 2. vii. 43; Benth. in Proc. Linn. Soc. v. Suppl. 51; Eichl. in Mart. Fl. Bras. xxxviii. 201, tab. 47. fig. 4;—ramulis teretibus, tenuibus, subflexuosis, striatis, junioribus subfistulosis, fulvo-tomentosis, demum glabris; foliis elliptico-ovatis, utrinque subacutis, apice repente acuminatis et acutis, imo 5-nerviis, nervis paulo divergentibus et longitudinaliter subparallelis, intra marginem arcuatim nexis, transversim venosis et reticulatis, subcoriaceis, concoloribus, nitentibus, utrinque glabris, in nervis tantum subtomentosis; petiolo tenui, fulvo-tomentoso, limbo 5–6-plo brevior: pedunculo ♀ solitario, supra-axillari, tenui, stricto, suberecto, tomentoso, folio longiore, apice 1-floro, sepalis et petalis delapsis ovaria plurima sessilia uniseriata cano-pilosa in receptaculo parvo gerente; receptaculo demum in fructu mutato et in carpophora 9–10 elongata erecta 4-gona 3-sulcata umbellata tomentella imo in tubum coalita sursum libera et erecta producto, singulis drupam unicam pulposam scabriusculam ferentibus.—In Guiana, Karauany (Sagot, 23): *v. s. in herb. De Candolle et Hook.*, Cayenne (Martin).

The leaves are  $5\frac{1}{2}$  inches long,  $2\frac{1}{2}$  inches broad, on a petiole  $1-1\frac{1}{8}$  inch long; the peduncle is 5–7 inches long; the umbelliform carpophora are 1 inch long, united at their base within by a thin web into a somewhat bell-shaped hollow tube; they are solidly affixed, being a growth of the torus, and each carries articulated on its apex a subglobular, shortly stipitated, fleshy, glabrous drupe, with a yellow shagreened surface, 6 lines long,  $4\frac{1}{2}$  lines broad.

2. *Sciadotenia clathrata*, nob.;—ramulis teretibus, striatis, obsolete rufo-tomentellis; foliis ovalibus, imo truncatis vel rotundatis, a medio sursum angustioribus, apice repente breviter acuminatis, cuspidato-mucronatis, e basi 5-nerviis, nervis intra marginem arcuatim nexis, transversim clathrato-venosis et reticulatis, utrinque nitidis, supra pallide viridibus, nitidis, nervis subimmersis, subtus paulo pallidioribus, nervis prominulis et subpuberulis; petiolo striato, tenui, fulvo-puberulo, limbo 4-5-plo brevior: pedunculo supra-axillari, solitario, folio longiore, tomentoso, apice ovaria circiter 16 uniseriaria cano-pilosa gerente; fructifero carpophoris 12, umbellatis, imo campanulatis coalitis, singulatim drupa glabra, flavida, subglobosa munitis.—In Guiana: *v. s. in herb. Mus. Brit.*, Demerara (Andersen), Cayenne (Martin).

This species differs from the preceding in its more ovate leaves, rounded at the base, with a shorter acumen cuspidately mucronated. The internodes are 1-1½ inch long; the leaves 4¼-5 inches long, 2½-3 inches broad, on a petiole 9-14 lines long; the slender peduncle is 3½-5 inches long, bearing on its summit about sixteen very compressed ovaries about ½ line long, very pilose, with a short, subulate, glabrous, inflected style; the carpophora are 7-9 lines long, united by a web at the base 3 lines long: the drupe is 4 lines in diameter, upon a stoutish stipitated support 1 line long; it has a lax pericarp, and a reniformly orbicular papyraceous putamen.

3. *Sciadotenia nitida*, nob.;—ramulis teretibus, striatis, glabris, fusco-opacis; foliis oblongis, imo rotundato-obtusis vel acutis, apice repente breviter attenuatis, acumine angusto et obtusulo, e basi 5-nerviis, nervis intermediis valde divaricatis et summum fere attingentibus, et illic cum aliis utrinque 1-2 arcuatim nexis, nervis tenuibus venisque crebris conspicuis transversim parallelis et prominulis, fusco-viridibus, supra nitentibus, subtus pallidioribus, glaucis, in costa nervisque prominentibus obsolete et adpressoferrugineo-puberulis, marginibus subcrenatis; petiolo tenui, fere glabro, limbo 4-plo brevior: pedunculo ♀ solitario, axillari, tenui, folio æquilongo vel fere 2-plo longiore, apice ovaria plurima sessilia pilosa sepalis involucrata gerente, demum carpophoris paucis longiusculis liberis cinereo-puberulis 4-sulcatis emissis.—In Brasilia: *v. s. in herb. Hook.*, Pará (Burchell, 9775 et 9784).

This has a very different aspect from all the others, on account of its very dark-coloured leaves. The axils are cupuliform, 1-1½ inch apart; the leaves are 3½-4½ inches long, 1¾-2¾ inches

broad, on a petiole  $1-1\frac{1}{4}$  inch long : the peduncle is  $5-5\frac{1}{4}$  inches long, the carpophora 4 lines long.

4. *Sciadotenia leucophylla*, nob. ;—ramulis teretibus, striatis, fuscis, opacis ; foliis elongato-oblongis, a medio utrinque gradatim angustioribus, imo cuneatis et in lobum angustum rotundiusculum constrictis, apice angustissime et longiuscule acuminatis, cuspidato-mucronatis, e basi 5-nerviis, nervis intermediis minus divaricatis, longe ultra medium protensis, cum exterioribus et cum aliis fere terminalibus utrinque 2 arcuatim nexis, venis plurimis, conspicuis, transversim parallelis et furcatis, hinc cancellato-reticulatis, supra læte viridibus, utrinque glaberrimis, subtus sordide albescensibus et pruinoso-glaucis, nervis tenuibus, brunneis, venisque paulo prominentibus ; petiolo tenui, limbo dimidio brevior, imo apiceque paulo incrassato, glabro, striato.—In Guiana : *v. s. in herb. Mus. Brit.*, Guiana Batavana (Anderson).

This is a well-characterized species : its internodes are  $\frac{1}{4}-\frac{1}{2}$  inch long ; the leaves are 8 inches long,  $3\frac{1}{4}-4\frac{1}{2}$  inches broad, on a petiole 3–5 inches long ; they are remarkable for the obscure whitish pruinose colour of their under surface. The specimen has no inflorescence.

5. *Sciadotenia Amazonica*, Eichl. *loc. cit.* p. 201, tab. 47. fig. 3 ;—ramulis teretibus, adpresse tomentellis ; foliis linearilanceolatis, imo obtusis vel subcuneatis, apice longe acuminatis, nervis 3–5 alternis et approximatis, basin versus ortis, intermediis, margine parallelis, fere ad apicem protensis, et cum aliis insuper utrinque 2 arcuatim nexis, transversim venosis et reticulatis, membranaceis, nitidis, supra glaberrimis, subtus ad nervos adpresse et minutissime puberulis ; petiolo tenui, limbo 3-plo brevior : pedunculo ♀ axillari, tenui, fusciscenti-tomentoso, petiolo paulo brevior ; carpophoris 6, alte connatis, fusco-tomentosis.—In Brasilia, prov. Alta Amazonas.

The foregoing character, taken from Dr. Eichler's description, shows this to be a very distinct species. The leaves are 5–6 inches long,  $1\frac{1}{4}-1\frac{1}{2}$  inch broad, on a petiole  $1\frac{1}{2}-2\frac{1}{4}$  inches long ; the peduncle is 2 inches long ; the carpophora are 6–8 lines long.

6. *Sciadotenia ramiflora*, Eichl. *l. c.* p. 202, tab. 47. fig. 5 ;—ramulis striolatis, fusciscenti-tomentosis, demum glabriusculis ; foliis oblongis, imo cordatis et rotundatis, ultra medium gradatim angustatis, apice acutis, e basi 5-nerviis, nervis intermediis ultra medium protensis, et cum aliis insuper utrin-

que 3 arcuatim nexis, venis transversis laxè reticulatis, submembranaceis, supra glaberrimis, nitidis, subtus ubique parce pilosiusculis; petiolo tereti, tenui, apice crassiore, limbo 5-plo breviorè: pedunculo ♀ e ramulo novello supra-axillari, passim folio uno alterove onusto, plerumque solitario (raro 2-3), bractea minuta donato, petiolo sæpius subbreviore, fuscotomentoso; carpophoris 6, subtenuibus, breviter connatis, tomentosus, singulis drupam subovoideam pilosiusculam suffulcientibus.—In Peruvia alta, circa Yurimaguas, in prov. Maynas (Pöppig, 2271).

This species is unknown to me. Its leaves are 3-5 inches long, 1-2½ inches broad, with a basal sinus 1 line deep, on a petiole 1-1½ inch long; the young floriferous branch is ¼-½ inch long; the peduncle is scarcely more than ¾ inch long; the carpophora are 4-6 lines long, connate for the length of 1½ line; the drupes are 4 lines long.

#### 49. TRICLISIA.

This genus was established by Mr. Bentham, in his 'Genera Plantarum' (i. 39), for some plants from western tropical Africa, some of them with very large, oblong, shining, quintuplinerved leaves with very divaricated branching nervures. The ♂ inflorescence is in two or more short panicles, fasciculated in the axils; the flowers have nine to seventeen sepals in ternary series, decreasing externally in size, the outer ones bracteiform and minute, the three innermost being always valvate in æstivation: in two of the species the flowers are globular in bud, the three inner sepals being very little larger than the others, very concave and orbicular; in two other species the flowers before opening are pyriform, the three inner sepals being three times as long as the others, cuneately oblong and acute: one species has no petals and only three stamens; another has three petals and three stamens, the two others having six petals and six stamens: the petals are squamiform, very minute, and might easily be overlooked, being affixed upon the andrœcium at the foot of the stamens: the stamens are of the length of the inner sepals; the filaments, erect or much incurved, are thickened gradually upwards into an almost clavate connective, which terminates in a more or less elongated excurrent point, as in *Chondrodendron*; the separated oblong anther-cells are half imbedded on each side of the connective; they are all glabrous and seated around the summit of an elevated andrœcium, which is surmounted by a dense fascicle of long, stiff, erect hairs quite as long as the stamens. The ♀ flower has similar sepals and petals, no stamens, six or more ovaries, which are stipitated, gibbous, incurved,

oblong, diminishing gradually into an elongated style, very pilose, all the styles connivent in the centre, as in *Pleogyne*. Finally the pedicels coalesce into a rounded tumescent mass covered with a number of hairy drupes, about the size of a pea, which are almost globular, straighter on the ventral side, with the remains of the style somewhat below the summit, and the point of their attachment on the same side above the base; the putamen is reniformly globose, thin and testaceous in texture, marked on the dorsal side by three slight carinal ridges, and by a small sinus in the middle of the ventral side: the condyle is small, and intrudes a short way into the cell at the point of the sinus, and there the integument of the seed is attached to it. The seed, which nearly fills the space of the cell, is exalbuminous, and is corrugated over its surface, into the shallow clefts of which the integument is insinuated. Mr. Benthams states that the embryo consists of two cotyledons so closely conferruminated together that the radicle is not distinguishable: on a slight examination it certainly bears this appearance; but if it be kept soaked in water a sufficient length of time, the seed swells to its full size, all the corrugations become obliterated, and the real structure becomes very apparent: the radicle is now seen to be of extraordinary dimensions, being half the size of the whole embryo; it is solid, fleshy, conical, somewhat attenuated at its extremity, where it is contracted into a small point which is suddenly inflected and directed towards the place of the persistent style, thus assuming the appearance of a small inflected radicle: the cotyledons, which occupy the lower moiety of the seed, are not at all agglutinated together; they are semi-oval in their transverse section, lunately curved, with their extremity turned upwards, so as nearly to touch the bottom of the radicle, thus leaving a cleft between them, where the integument is attached to the intruding condyle. This form of embryo is quite unique in the *Menispermaceæ*.

TRICLISIA, Benth.—*Flores* dioici. *Masc. Sepala* 12–18, in ordine ternario disposita, plerumque alternatim imbricata, externe gradatim minora, carnosula, orbiculari-acuta, extus pilosa, 3 interiora æstivatione valvata, reliquis aut vix majora, suborbicularia et concava, vel 3-plo longiora, cuneato-oblonga et subacuta. *Petala* rarius nulla, aut 3 vel sæpius 6, staminibus opposita, iis multoties breviora, squamiformia, carnosula, cuneato-oblonga vel orbiculata. *Stamina* 3 aut sæpius 6, libera, longitudine sepalorum, subbiseriata, alternatim paulo minora; *filamenta* intus sulcata, sursum gradatim valde incrassata, erecta vel arcuatim incurva, super *andræcium* paulo elevatum fasciculo pilorum staminum longitudine munitum



insecta; *anthera* 2-lobæ, lobis discretis, imo divaricatis, connectivo lateraliter subintrorsus semiimmersis, utrinque rima obliqua hiantibus, connectivo sæpius longe excurrente apiculatæ.—*Fœm.* *Sepala* 9, suborbicularia, concava, extus pilosa, quorum 3 interiora paulo majora, æstivatione valvata. *Petala* nulla. *Stamina sterilia* parva. *Ovaria* 6 vel plura, gibboso-ovata, trigonoideo-compressa, pilosa, *gynæcio* piloso insita, apice latere interno in stylum sensim attenuata; *styli* subulati, in centrum horizontaliter conniventes. *Drupæ* paucae vel plurimæ, receptaculo amplificato aggregatæ, gibboso-ovatæ, sub-siccæ, velutinæ, styli vestigio infra apicem notatæ; *putamen* reniformi-ovatum, dorso convexum et 3-carinatum, ventre rectiusculum et medio sinu parvo exsculptum, tenuiter testaceum; *condylus* parvus, sinum versus intra loculum paulo intrusus et convexus. *Semen* loculo conforme, exalbuminosum, siccum corrugatum, humectum læve; *integumentum* tenuiter membranaceum, rugis insinuatum et ad condylum affixum: *embryo* ovatus, vix compressus; *radicula* supera, macropoda, dimidium loculi implens, solide carnosæ, obtuse conica, summo apiculatim constricta et hic subito adpresse et incumbentim inflexa, apiculo ad stylum spectante; *cotyledones* loculi reliquum farciens, distinctæ, crasse carnosæ, accumbentes, basin versus subito incumbentim uncinato-curvedatæ, extremitatibus radiculam fere attingentibus.

*Frutices Africa tropicæ occidentalis scandentes; folia petiolata, sæpe majuscula, oblonga vel ovata, imo cordata aut rotundata, e basi 5- vel 5pli-nervia, supra glabra, subtus pubescentia: paniculæ ♂ axillares, sæpe fasciculatæ, petiolo breviores, sericeo pubescentes: inflorescentia ♀ in ramulo novello axillaris, brevissime corymbulosa; flores in capite subsessiles, approximati.*

1. *Trichisia macrophylla*, Oliv. MS.;—ramis teretibus, striatis, glabris; ramulis validiusculis, striatis, tomentosis; foliis ovato-oblongis, imo cordatis, apice subito attenuatis et anguste acuminatis, acutis, e basi 5-nerviis aut 7pli-nerviis, cum nervis alteris pinnatis utrinque 3–4 anastomosantibus, nervis venisque transversis reticulatis superne impressis, supra fusco-viridibus, nitentibus, glabris, subtus pallide brunneis, glaucis, costa nervisque prominentibus et ferrugineo-pubescentibus, cæteroque glabris; petiolo tereti, pubescente, valido, apice crassiore, imo tumido, limbo 6-plo brevior: paniculis ♂ e nodis annotinis plurimis, fasciculatis, puberulis; rachi brevissima aut fere obsoleta; floribus brevissime pedicellatis, subaggregatis; sepalis 9–12, plerisque sericeo-pilosis, exterioribus gradatim minoribus et bracteiformibus, ovatis, sub-acutis, imbricatis, 3 interioribus oblongis, imo longe cuneatis,

concavis, carnosis, extus adpresse velutinis, æstivatione valvatis, demum reflexis; petalis nullis; staminibus 6, æqualibus, subbiseriatis, quorum 3 interdum deficientia, andrœcio longe piloso insitis, erectis, filamentis sepalis fere æquilongis, teretibus, glabris, sursum sensim crassioribus, hinc extus gibbosis, connectivo in apiculum breve obtusum inflexum excurrente.—In Africa æquinoctiali: *v. s. in herb. Hook.* ♂, Fernando Po (Mann, 197).

This is said to be a climbing plant, with stems and branches 30 feet long, growing to the height of 10 feet above the ground. The axils are 2–4 inches apart; the leaves are 8–12½ inches long (including the basal sinus ¼–¾ inch deep), 5–7¼ inches broad, on a petiole 1½–2 inches long. The fasciculated panicles are about 1 inch long, each on a peduncle 6 lines long, having alternate branchlets 3 lines long, bracteolated at base, and bearing alternate pedicels 2 lines long, each with a minute bract at base; each flower has two bracts ½ line long, three outer sepals ½ line, three intermediate sepals ¾ line, three inner ones 2 lines long; the stamens are seated upon a short glabrous cylindrical receptacle crowned with many long hairs, the filaments swelling in the middle, being incurved, the excurrent connectives connivent towards the centre.

2. *Trichlisia patens*, Oliv. MS.;—ramis teretibus, vix sulcatis, lenticellatis, glabris; ramulis teretibus, striolatis, flavescens-tomentellis; foliis oblongo-ovatis, imo rotundiusculis et circa petiolum subito constrictis, apice repente et breviter attenuatis, acumine acuto, 3-nerviis vel 5pli-nerviis, nervis extus ramosis et cum alteris pinnatis utrinque 3 arcuatim nexis, supra nitidis, valde reticulatis, glabris, subtus paulo pallidioribus et ad nervos venasque obsolete puberulis, cæteroquin glabris; petiolo tenui, limbo dimidio brevior, tereti, subtenui, stricto, striolato, fulvo-tomentello: paniculis ♂ plurimis in axillis nodosis annotinis fasciculatis, fulvido-puberulis, petiolo dimidio vel 3-plo brevioribus, a basi ramosis, ramis alternis, iterum ramulosis; floribus crebriter corymbosis; sepalis 12, exterioribus gradatim minoribus et bracteiformibus, pilis longis extus sericeis, carnosus, 3 interioribus multo majoribus, oblongis, imo longe cuneatis, concavis, æstivatione valvatis, demum reflexis; petalis 3, minimis, spathulato-linearibus, apice truncatis, carnosulis, staminibus affixis; staminibus 3, longitudine sepalorum, suberectis, filamentis imo tenuibus, apice incrassatis et paulo inflexis, connectivo in apiculum longum obtusulum excurrente, cum petalis fasciculoque pilorum summo andrœcii brevis glabri insitis.—In Africa æquinoctiali: *v. s. in herb. Hook.* ♂, Bagroo River (Mann, 797).

The branches are straighter and more slender than in the preceding species, with axils  $\frac{3}{4}$ – $1\frac{1}{2}$  inch apart; the leaves are  $4\frac{1}{2}$ – $5\frac{1}{2}$  inches long,  $2\frac{3}{4}$ – $3\frac{1}{4}$  inches broad, on a slender petiole 2–3 inches long; the panicles are 1– $1\frac{1}{2}$  inch long, with spreading branches again subdivided; the flower expanded is 3 lines broad; the nine outer sepals, in three series, are somewhat triangular, from  $\frac{1}{2}$  to  $\frac{3}{4}$  line long; the three inner sepals, broadly unguiculate at base, are  $1\frac{1}{2}$  line long; the three petals,  $\frac{1}{4}$  line long, are seated opposite to and outside the three stamens, together with a tuft of erect hairs, upon the summit of a short, glabrous, cylindrical receptacle; the filaments,  $1\frac{1}{2}$  line long, much thickened and incurved above, terminate in a terete obtuse excurrent point; the anther-cells, oblong, divergent at base, are introrse and somewhat imbedded in the fleshy filament.

3. *Trichlisia coriacea*, Oliv. MS.;—ramulis teretibus, substriolatis, adpresse ferrugineo-puberulis; foliis late ovatis, imo vix truncatulis, apice rotundatis et breviter canaliculato-plicatis, e basi 5-nerviis, nervis extus ramosis et cum alteris pinnatis utrinque 2 marginem versus anastomosantibus, coriaceis, supra nitidulis, valde reticulatis, glabris, ad nervos subsulcatis, marginibus incrassatis et revolutis, subtus concoloribus, in nervis venisque valde prominentibus rubro-pilosis; petiolo tereti, flexuoso, piloso, supra sulcato, limbo 3-plo brevior; floribus ♂ perplurimis, fasciculatis, brevissime petiolatis, hinc in capitulum sessile axillare aggregatis; sepalis 15–18, suborbicularibus, carnosulis, concavis, crebriter imbricatis, extus sericeo-pubescentibus, exterioribus gradatim minoribus, parvis, 3 interioribus paululo majoribus et æstivatione valvatis; petalis 6, minutissimis, squamiformibus, oblongis, carnosis, glabris; staminibus 6, suberectis, filamentis breviusculis, compressis, incurvis, æqualibus, connectivo vix excurrente obtusulo, andrœcii brevis summo longissime piloso.—In Africa æquinoctiali: *v. s. in herb. Hook.* ♂, Fernando Po (Mann, 174).

A climbing plant, 10–15 feet long, 10 feet high, with an aspect very different from the two preceding species. The axils are  $\frac{3}{4}$ – $1\frac{3}{4}$  inch apart; the very coriaceous, almost orbicular leaves are  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches long, 2– $2\frac{1}{4}$  inch broad, on a petiole about 1 inch long. The flowers in bud are globular and almost sessile; each consists of two bracts and twelve or fifteen sepals in four or five series, all orbicular, concave, externally pubescent, all with ciliated margins, except those of the inner series, which have a valvate æstivation and are about 1 line in diameter; the six petals are orbicular,  $\frac{1}{4}$  line in diameter, externally opposite

to as many stamens, and with them seated on the top of a very short, glabrous, cylindrical receptacle, together with a thick tuft of stiff hairs as long as the stamens; filaments incurved, thick, fleshy, 1 line long, very shortly excurrent at the apex; anther-cells oblong, divergent at base, introrsely and dorsally adnate upon the filament.

4. *Trichlisia subcordata*, Oliv. MS.;—ramis teretibus, striatis, glabris, ramulis patentibus, flexuosis, tomentosus; foliis late ovatis, imo subcordatis, apice valde obtusis aut subacutis et mucronatis, e basi 3-nerviis et triplinerviis, nervis cum alteris pinnatis utrinque 3 anastomosantibus, supra nitidis, valde reticulatis, glaberrimis, subtus pallidioribus, glaucis, costa uervisque tenuibus, ferrugineo-tomentosis, cæteroquin glabris, marginibus subrevolutis et interdum crenulato-undulatis; petiolo flavo-tomentoso, limbo 4-5-plo brevior: inflorescentia ♂ axillari, dense pubescente: pedunculo brevissimo, crassiusculo, ramis brevissimis, apice 3-floris; floribus brevissime pedicellatis, pedicellis imo 3-bracteolatis; sepalis 12, extus gradatim minoribus et bracteiformibus, acute ovatis, carnosulis, extus carinatis et dense pilosis, 3 interioribus suborbiculatis, concavis, æstivatione valvatis; petalis 6, squamiformibus, carnosulis, glabris, acute ovatis, cum staminibus andrœcio affixis; staminibus 6, æqualibus, filamentis sursum sensim valde incrassatis, falciformi-incurvis, connectivo excurrente obtusulo longe apiculatis, et in centro conniventibus, glabris; andrœcii brevissimi summo longissime piloso. Inflorescentia ♀ axillari, ♂ valde simillima; sepalis ut in masc.; petalis nullis; ovariiis circiter 6, gibboso-oblongis, stylisque rectis, æquilongis, ad centrum spectantibus, longe pilosis; gynæciis tomentosis, cum pedicellis demum confluentibus, et receptaculum fere sessile, crassum, globosum, drupas 18 vel pauciores crebriter acervatas gerens formantibus; drupis subovalibus, tomentosis, piso majoribus.—In Africa æquinoctiali: *v. s. in herb. Hook.*, Nupi, Niger river, ♂ et ♀ (Barter, 1146 et 3397). 3

A scandent plant, with smooth flexuous branches, with axils 2-3 inches apart: in the ♂ plant the leaves are somewhat pointed at the apex, 4-5 inches long,  $2\frac{1}{2}$ - $3\frac{3}{4}$  inches broad, with irregularly crenated margins, on a petiole  $\frac{3}{4}$  inch long: in the ♀ plant they are roundish at the apex, with entire margins,  $3\frac{3}{4}$ -4 inches long,  $3$ - $3\frac{1}{4}$  inches broad, on a petiole  $\frac{3}{4}$ -1 inch long. The ♂ panicle is axillary, scarcely more than 6 lines long, shortly pedunculated, with extremely short 3-flowered branchlets, forming a close, almost globular head; the flowers are green, nearly sessile, oblong-oval in bud, nearly 2 lines long, consisting of

twelve sepals in four series, gradually decreasing outwards in size; these are very concave, suborbicular, somewhat pointed at the apex, the three inner ones are 2 lines long, with thick valvate margins; the six petals are oblong,  $\frac{1}{4}$  line long, fixed externally opposite the six stamens, all seated on the apex of a very short column together with a tuft of stiff hairs, as long as the stamens, concealing the rudiments of six sterile ovaries; the filaments are much thickened above, lunately incurved, terminating in a long, conical, excurrent connective pointing towards the axis; the anther-cells are separated and laterally semi-immersed in the fleshy filament. The ♀ panicle, or rather clustered head of flowers, is seated on a very short peduncle; the sepals are similar in size to those of the ♂ flower, a little more pointed and oblong; the sterile stamens are fixed in the centre round the much larger, gibbously oblong, pilose ovaries, which gradually terminate in as many terete styles diagonally converging towards the axis; the drupes, seated upon a rounded fleshy hairy receptacle, are  $3\frac{1}{2}$  lines long, 3 lines broad, fixed by a small hilum on the lower ventral angle, the upper angle being marked by the vestige of the style; the putamen is dorsally 3-ribbed, with a small excavation in the middle of the ventral face; the structure of the seed has been already fully described.

#### 50. PYCNARRHENA.

This genus was established by me in 1851 upon an Indian plant in the Wallichian Collection. It is easily recognized by its oblong, acuminate, simply penninerved leaves, upon short and remarkably tumid petioles: this manner of nervation, though less frequent, is not rare among the *Menispermaceæ*; for it occurs also in *Hyperbæna*, *Antitaxis*, *Penianthus*, *Clambus*, *Elissarrhena*, *Spirospermum*, and *Rhaptonea*. It is also remarkable for having nine stamens almost without filaments, or, rather, as many 2-celled anthers, crowded in three series so as to form a sessile central head, after the manner of *Anamirta*; the anthers are transversely oval, 2-valved, gaping by a common horizontal suture. The drupe is oval, with the vestige of the style placed a little above the middle on the ventral face; the putamen is reniformly oval, somewhat compressed, thin and testaceous, the seed being appended to the slight intrusion of an almost obsolete condyle on the ventral side; the embryo is exalbuminous; the cotyledons, occupying almost the whole space of the cell, are very fleshy, accumbent, lunately incurved at the apex towards the ventral face, where the minute radicle points to the persistent style. The genus comes near to *Antitaxis*.

PYCNARRHENA, nob.—*Flores* dioici. *Masc. Sepala* 6–9, ternatim disposita, exteriora gradatim minora et bracteiformia, 3 interiora multo majora, cuneatim ovalia, valde concava, æstivatione imbricata. *Petala* 6, sepalis breviora, cuneata, transversim latiora, apice subtruncata, lateribus paulo oblique involutis, membranacea. *Stamina* 9, in glomerulum centralem crebriter aggregata; *filamenta* brevissima, tenuia, fere obsoleta; *antheræ* subglobosæ, cruciatim sulcatæ, septo transverso bivalvatim hiantes, loculo antico septulo verticali diviso, hinc inæqualiter 3-locellatæ.—*Fl. Fœm.* ignoti. *Drupa* gibboso-ovata, styli vestigio facie ventrali supra medium notata, glabra: *putamen* subreniformi-ovatum, paulo compressum, læve, chartaceo-testaceum, 1-loculare; *condylus* e sinu ventrali intra loculum paulo intrusus, hinc convexiusculus. *Semen* loculo conforme, exalbuminosum; *integumentum* tenuiter membranaceum, facie ventrali condylo affixum: *embryo* loculum implens; *cotyledones* magnæ, carnosæ, accumbentes, apice incumbenter incurvæ, radícula minima supera ad stylum spectante multoties longiores.

Frutices *Indiæ orientalis et insularum indigeni*; rami rigidi, flexuosi, axillis nodosis et approximatis; folia oblonga, utrinque subacuta, lucida, glaberrima, penninervia, supra in nervis sulcata, petiolo brevi, apice valde tumido et cavo: paniculæ ♂ perplurimæ vel pauciores, supra-axillares, fasciculatæ, interdum brevissimæ et crebriter subglomeratæ, aut laxè ramosæ et petiolo paulo longiores; flores parvi: in ♀ pedicelli pauci, axillares, et 1-flori.

1. *Pycnarrhena pleniflora*, nob. in Ann. Nat. Hist. 2 ser. vii. 44; —*Pycnarrhena planiflora*, Hook. & Th. Fl. Ind. i. 206; —*Cocculus planiflorus*, Wall. (pro errore typographico vice pleniflorus); —ramulis teretibus, pallidis, striolatis, junioribus breviter puberulis, demum glabris, axillis approximatis et valde cupuloso-nodosis; foliis elliptico-oblongis, imo subcuneatis, medio latioribus, apice subito angustissime attenuatis, acumine calloso mucronatis, penninerviis, nervis utrinque circiter 7 arcuatim nexis, supra pallidis, nitidis, in nervis late sulcatis, reticulatis, glaberrimis, subtus nervis prominentibus et subpuberulis, marginibus crassiusculis et revolutis, petiolo limbo 11-plo brevior, rigido, supra canaliculato, apice tumido et ad limbum geniculatim affixo: inflorescentia ♂ axillari, e pedunculis numerosissimis fasciculatis brevissimis apice 1–2-floris composita, pedicellis brevissimis; floribus parvis, hinc in capitulum fere sessile in axilla crebriter aggregatis: pedicellis ♀ perplurimis, in axillis fasciculatis, brevissimis, 1-floris.—In India orientali: v. s. in herb. Soc. Linn. ♂,

Sylhet et in hort. bot. Calc. cult. (Wall. Cat. 4961); *in herb.*  
*Hook.* ♀, Bengal (Griffiths).

In all the lithographic tickets issued with Wallich's specimens the specific name is written by mistake *planiflorus*. The branches are  $\frac{3}{4}$ –1 line in diameter, and the cupuliform axils are 1 inch apart; the leaves are  $5\frac{1}{2}$ – $6\frac{1}{2}$  inches long,  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches broad, on a petiole 6–7 lines long, remarkable for the very tumid laterally compressed tumescence at its summit. The peduncle and pedicels (when 2-flowered) are only 2 lines long, the flowers before expansion being  $\frac{3}{4}$  line in diameter. In the ♀ specimen there are three slender pedicels in each axil,  $2\frac{1}{2}$  lines long: the pedicel thickens as the fruit becomes matured; the drupe is glabrous, polished, 5 lines long,  $4\frac{1}{2}$  lines broad, the epicarp being corrugated, from which we may infer that it was filled with pulp before it became dried; the putamen is smooth, thin, and chartaceous.

2. *Pycnarrhena tumefacta*, nob.;—scandens, ramulis teretibus striatis; foliis lanceolato-oblongis, imo paulo angustioribus et obtusis, summum versus sensim angustioribus, et ad apicem lineari-attenuatis, acumine angusto et obtusulo, penninerviis, nervis utrinque 7–8, alteruatis, fere ad marginem protensis et hic arcuatim nexis, supra lucidis, in nervis sulcatis, valde reticulatis, subtus pallidis, nervis prominentibus, glabris; petiolo tereti, apice longe tumefacto, tumore superne valde canaliculato, deorsum profunde dilatato et compresse sublaminiformi: paniculis ♂ supra-axillaribus, 3–4, fasciculatis, petiolo 2-plo longioribus, laxe ramosis; rachi ramisque tenuibus, flexuosis, breviter et rigide pilosulis; floribus parvis; sepalis 6 exterioribus minimis, apice ciliolatis, 3 interioribus obrotundatis, valde concavis, glabris, carnosulis, marginibus membranaceis; petalis 6, triplo brevioribus; antheris 9, seriebus 3 in capitulum centrale fere sessile acervatim aggregatis.—In Borneo: *v. s. in herb. Hook.* ♂, Banjarmassing (Mottley, 357).

This is said to be "a very large climber, with white flowers." The axils are about 1 inch apart; the leaves are 9 inches long,  $2\frac{1}{2}$  inches broad, with a narrow acuminate apex  $\frac{3}{4}$  inch long, 1 line broad, the petiole being  $1\frac{1}{8}$ – $1\frac{1}{4}$  inch long, with a deeply channelled tumefaction at its apex, 6 lines long,  $\frac{3}{4}$  line broad, and 2 lines deep; the panicles are nearly 2 inches long, their branches  $\frac{1}{2}$  inch long, the pedicels  $1\frac{1}{2}$  line, the flowers very small.

3. *Pycnarrhena mecistophylla*, nob.;—ramulis teretibus, tomentosis; axillis approximatis; foliis longissimis, lanceolatis, imo rotundiusculis, apice anguste attenuatis, penninerviis, nervis utrinque 10–12, tenuibus, marginem versus arcuatim nexis,

supra viridibus, subnitidis, glabris, subtus brunnescenti-glaucis, glabris (nervis venisque puberulis exceptis); petiolo subtenui, imo crassiore, apice tumidulo et geniculatim inflexo, subpuberulo, limbo 4-plo brevior.—In Himalaya: *v. s. in herb. Hook.*, Assam (Griffiths, 1264).

This species differs from the preceding in its longer, narrower, darker leaves, rounded at their base, puberulous beneath on their nerves and veins, with a much longer and pubescent petiole. The internodes are less than  $\frac{1}{2}$  inch apart; the leaves are  $8\frac{1}{2}$ – $9\frac{1}{4}$  inches long,  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches broad, on a petiole 2 inches long. The specimen has no inflorescence.

#### 51. ANTITAXIS.

This genus was proposed by me in 1851 for a plant collected in Malacca by the late Mr. Griffiths, with male flowers. It is only lately that I have seen other specimens in fruit. It has large lanceolate leaves, with alternate pinnate slender nerves, anastomosing towards the margin, and with rather short petioles: in the ♂ it has a few slender 1-flowered pedicels, fasciculated in each axil; in the ♀ the inflorescence is similar. The ♂ flower has eight sepals decussately arranged in opposite pairs, the two inner series being larger, equal in size, and imbricated in æstivation; it has two petals alternate with the inner pair of sepals, and somewhat smaller than these, four stamens cruciately placed opposite the petals, with filaments somewhat shorter than they, fleshy, thickening upwards, the anthers partly immersed in their summits, globular, 1-lobed, opening somewhat extrorsely by a diagonally transverse fissure, showing two gaping lips, as in *Anelasma* and *Elissarrhena*. The ♀ flower is unknown; but the drupes are subglobose and tomentose, with a somewhat reniform putamen, which is chartaceous and brittle, with an almost obsolete condyle in the sinus of the ventral side; the embryo is exalbuminous, reniformly orbicular, with large, fleshy, curving, accumbent cotyledons which nearly fill the cell, and a very minute, somewhat superior radicle. The leaves are coriaceous, glabrous, shining, having a peculiar nervation resembling that in *Pycnarrhena*, *Clambus*, and *Penianthus*. In its inflorescence, with several 1-flowered pedicels fasciculated in each axil, it resembles *Pycnarrhena*, as well as in its globular anthers opening extrorsely by a gaping fissure—a feature repeated in *Anelasma*, *Jateorhiza*, and *Elissarrhena*. The chief peculiarity of *Antitaxis* is in the dimerous arrangement of its floral parts; but the *Menispermaceæ* are far from constant in their usual ternary disposition, as we find also binary sepals and petals in



*Antizoma*, *Clypea*, *Peraphora*, and others of the *Cissampelidæ*, while in several genera of the family the floral parts are found in numbers varying between two and seven; or even beyond this. When I published the synopsis of the genera (Ann. & Mag. Nat. Hist. ser. 3. vol. xiii. p. 124; *vide suprâ*, p. 18), a separate section was made to include all those of which (for want of sufficient evidence) the tribe to which they belong could not be determined; to this section *Antitaxis* was then referred. Since that time I have seen its fruit, which closely resembles that of *Pycnarrhena* and other genera of the *Pachygoneæ*; consequently *Antitaxis* must now find its place in that tribe: its wood is unmistakably of Menispermaceous structure. The authors of the 'Nova Genera' (i. p. 33), in one sentence, expel this genus and *Odontocarya* from this family, because they appeared to them to offer no character distinct from the *Euphorbiaceæ*, and because they differ from *Menispermaceæ* in their inflorescence and in their habit. The strong evidence afforded here and elsewhere completely disproves all these inferences.

ANTITAXIS, nob.—*Flores* dioici. *Masc.* *Sepala* 8, per paria decussatim opposita, 2 exteriora bracteiformia, extus longe pilosa, 2 sequentia late obovata, apice truncata, ciliato-fimbriata, 4 interiora paulo majora, æqualia, suborbicularia, concava, carnosula, glabra, æstivatione imbricata. *Petala* 2, tenuiora, obovata, apice truncata, sepalis 2 interioribus alterna et paulo breviora. *Stamina* 4, cruciatim disposita, petalis opposita et paululo breviora; *filamenta* carnosula, sursum gradatim incrassata; *antheræ* filamenti vertici semimmersæ, subglobosæ, carnosæ, 1-lobæ, subextrorsæ, rima subobliqua transversim et bivalvatim hiantes. *Ovarii* rudimentum nullum.—*Fœm.* *Flores* ignoti. *Drupæ* 3, aut abortu pauciores, subglobosæ, exsiccæ, velutinæ, styli vestigio facie ventrali notatæ; *putamen* subreniformi-ovatum, tenuiter chartaceum, fragile, 1-loculare; *condylus* parvus, internus, intra loculum sinum versus paulo intrusus aut fere obsoletus. *Semen* reniformi-globosum, exalbuminosum; *integumentum* membranaceum, sinum versus *chalaza* majuscula notatum: *embryo* reniformi-globosus, loculum implens, *cotyledonibus* magnis, carnis, crassis, accumbentibus, curvatis, *radicula* minima supra ad styli vestigium spectante multoties longioribus.

Frutices *Asiatici*, forsân scandentes; ramuli pubescentes, demum glabri, cupuloso-nodosi; axillis approximatis; folia oblonga vel oblongo-lanceolata, glaberrima, nervis imparipinnatis; petiolo subbrevis, imo apiceque subtumidulo: pedicelli ♂ axillares, plurimi, fasciculati, gracillimi, 1-flori, internodiis sæpius æqui-

*longi*; ♀ *axillares, pauciores, crassiores, 1-flori*; drupæ *subgloboæ*.

1. *Antitaxis fasciculata*, nob. in Ann. Nat. Hist. ser. 2. vii. 44; —ramis lævibus, sparse verrucosis, ramulis teretibus, striolatis, junioribus pubescentibus, demum glabris, axillis approximatis, alternatim cupuloso-nodosis; foliis oblongis, basi rotundato-obtusis, apice acuminatis, acute mucronatis et canaliculatim recurvis, subcoriaceis, pinnatinerviis, nervis utrinque 6–7 arcuatim nexis, superioribus alternatis, supra tenuissimis, subimmersis, subtus validioribus et prominulis venisque reticulatis, glaberrimis, concoloribus, superne lucidioribus; petiolo tereti, ferrugineo-tomentoso, apice tumidulo, limbo 5-plo longiore: pedicellis ♂ axillaribus, plurimis, e nodo tomentoso fasciculatis, 1-floris, glabris, gracilibus, petiolo paulo brevioribus.—In peninsula Malayana: *v. s. in herb. meo et Hook.* ♂, Malacca (Griffiths).

The branchlets are rigid, somewhat flexuous, with cupulary nodes rarely more than half an inch apart, in which the petioles are inserted: above them is seen a very prominent tomentous tuft, out of which the pedicels spring. The wood is close and hard, with fine medullary rays. The leaves are about 4 inches long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  inch broad, on a petiole about  $\frac{3}{4}$  inch long: six to ten very slender pedicels grow out of each axillary tuft; they are 5–7 lines long, the flower before expansion being 1 line in diameter.

2. *Antitaxis cauliflora*, nob.; —ramis striolatis, teretibus, subangularibus, glabris, axillis compresso-dilatatis; ramulis teretibus, enodosis, glabris, junioribus subpuberulis; foliis elongato-oblongis, imo obtusis, apice breviter attenuatis et acutis, utrinque glaberrimis, submembranaceis, supra læte viridibus, subtus pallidioribus, pinnatinerviis, nervis altrinsecus 5–6, alternis, tenuissimis, supra subimmersis, subtus prominentibus; petiolo tenui, apice vix crassiore, subpuberulo, limbo 6–7-plo brevior: pedicellis ♀ axillaribus, 3–5, fasciculatis, validiusculis, 1-floris; drupis 1–3, siccis, ovatis, tomentosis, stylo laterali signatis.—In Java: *v. s. in herb. Mus. Brit.* ♀ fructiferam (Horsfield).

This is a female plant very near the preceding, and which bears more the appearance of an erect than a scandent shrub. The internodes of its branchlets are  $\frac{1}{2}$ –1 inch long; the leaves are 5– $7\frac{1}{2}$  inches long, 2–3 inches broad, on a slender petiole scarcely thickened at its apex, 9–10 lines long: the flowers are upon the main branch, which is provided with leaves above, but lower down the pedicels grow out of the axils of the leaves

which have fallen away; and when the upper leaves have also disappeared, the branchlet appears like a long raceme; two to six rather stout pedicels radiately divaricate from each axil, 3-4 lines long, most of which support a single drupe, leaving cicatrices of two others which were abortive; the drupe is 4 lines long, 3 lines broad; they are not mature, the enclosed seed being shrivelled and undeveloped.

3. *Antitaxis lucida*, nob.;—*Cocculus lucidus*, *Teysen & Bennings*, *Nat. Tijdsch.* iv. 397;—ramulis subtenuibus, subflexuosis, glabris; foliis oblongis, imo rotundiusculis aut valde obtusis, apice breviter attenuatis et canaliculatis, acumine obtusulo, ultra basin penninerviis, nervis semiimmersis, utrinque 7, divaricatis, inter se arcuatim nexis, transversim venosis et reticulatis, coriaceis, utrinque glaberrimis, supra lucidis, subtus opace concoloribus, marginibus cartilagineis, subrufis et prominulis; petiolo subtenui, apice paulo incrassato et ruguloso, limbo 6-8-plo brevior; pedicellis fructiferis axillaribus, 4, fasciculatis, abortu paucioribus, petiolum subæquantibus; drupa abortu solitaria, globosa, exsicca, glabra, nitida, putamine chartaceo, 1-loculare, condylo interno, laterali, paulo intruso, subobsoleto, semine subgloboso, ad latus ventrale sinu parvo notato.—In Java: *v. s. in herb. Hook.* ♀, in hort. Bogor. cult. (T. Anderson).

A plant with subflexuous slender branches, and with axils  $\frac{1}{2}$ – $\frac{3}{4}$  inch apart: the leaves are 3–3 $\frac{3}{4}$  inches long, 17–18 lines broad, on a petiole 5–6 lines long; the pedicels are 5 lines long, each bearing on its summit a single drupe, with the cicatrices of two abortive ovaries; the drupe is 4 $\frac{1}{2}$  lines in diameter, with a thin, very brittle, chartaceous putamen, from which the mesocarp is with difficulty separable; the putamen is slightly indented on the ventral side, where it is provided with an almost obsolete slightly intruding condyle; the seed which fills the cell is subreniformly globular, with a short sinus where it is attached to the condyle, and where a broad chalaza of the membranaceous integument faces it; the exalbuminous embryo fills the cell; when swollen to their full size, the cotyledons are very large, thick, fleshy, and subreniform, accumbent, with a very minute superior radicle.

4. *Antitaxis longifolia*, nob.;—*Cocculus longifolius*, *DC. MS.*;—foliis lanceolatis, imo rotundatis, ultra medium sensim attenuatis, acumine angusto, paululo emarginato, submembranaceis, imparipinninerviis, nervis utrinque 10–11, tenuissimis, arcuatim nexis, supra viridibus, tenuiter reticulatis, nitidis, subtus pallidioribus, glabris; petiolo tenuissimo, apice

paulo incrassato costaque mediana puberulo: pedicello ♀ supra-axillari, solitario, tenui, glabro, petiolo æquilongò, 1-floro; ovariis 2-3, gibboso-ovatis, flavido-tomentosis.—In insula Timor: *v. s. in herb. Mus. Paris.*

It is now some years since I saw this specimen in the Paris Museum, which, from its habit and especially the nervation of its leaves, closely approaches the two preceding species: it has much smaller leaves, and is distinct from both. The leaves are  $4\frac{1}{4}$  inches long,  $1\frac{1}{4}$  inch broad, with ten to twelve pairs of alternate delicate nervures, and very fine reticulations, the petiole being 9 lines long: the ♀ pedicel is 9 lines long, and the gibbous drupes 2 lines long.

5. *Antitaxis ramiflora*, nob.;—ramulis validiusculis, subangulatis, glabris, junioribus tomentosis; foliis subparvis, oblongo-ovatis, imò rotundatis, apice obtusis, ultra basin alternatim penninerviis, nervis tenuibus, utrinque circiter 4 vix prominulis, tenuiter reticulatis, pallide viridibus, concoloribus, costa nervisque subtus subpuberulis; petiolo tenui, pubescente, limbo 3-4-plo breviorè: racemis ♀ fructiferis axillari-bus; rachi patente, valida, longiuscula, fulvo-tomentosa, imum versus nuda vel sæpius foliis 1-2 munita, superne alternatim pedicellata; pedicellis brevibus, crassis, imò bracteolatis, drupas 3 aut pauciores ovatas tomentosas gerentibus.—In Siam: *v. s. in herb. Hook., ex herb. Bogor.* (Teysen, 5993).

This species differs from any of the preceding in the much smaller size of its more ovate leaves, and in its racemose inflorescence, in which respect it resembles *A. cauliflora*. There are few leaves upon the specimen, and these only on young branchlets or on the floriferous branches; they are  $1\frac{3}{8}$ -2 inches long,  $1-1\frac{1}{8}$  inch broad, on a slender petiole 5 or 6 lines long. The flowering branches are 1-5 inches long, very divaricating, furnished towards the base for one-third their length with regular leaves at intervals of 3 lines, but which for the most part have fallen off the specimen (as in *A. cauliflora*), thus giving it the appearance of a long raceme: the branches in this manner are bare at the base, above which the pedicels alternate towards the extremity at intervals of about 3 lines; they are  $1-1\frac{1}{2}$  line long, half that thickness, and are much swollen at their extremity by a globular receptacle, upon which from one to three drupes are seated; the bracteole at the foot of the pedicels is  $\frac{1}{2}$  line long, acute; the drupes are 5 lines long, 3 lines broad. The drupes I examined were void of seed; but they correspond so exactly with those of the other species that there can be no doubt in regard to their structure.

## 52. SPIROSPERMUM.

This genus was founded, in 1806, upon a Madagascar plant, by Du Petit-Thouars, who gave a very meagre description of it. De Candolle, in 1818, arranged the genus in *Menispermaceae*, in his 'Systema,' comprising all the details afforded by Thouars within the space of six lines; and that is all we know of the plant since that time. In my prefatory remarks on this order (*suprà*, p. 19), not having then seen the plant, I excluded the genus from the family, on account of the spiral form of its embryo, and upon the following grounds. In every instance throughout the *Menispermaceae* I had found the embryo always more or less incurved, the degree of its curvature invariably corresponding with the extent of excentric growth of the ovary and fruit, the cotyledonary end of the embryo being seen invariably in close proximity to the basal point of attachment of the fruit, while the radicular extremity as constantly points to the vestige of the deflected style, the latter being generally drawn down near to the basal point of attachment: hence, in the most extreme cases, the embryo never completes an entire circle; and from the constancy of this feature, it was naturally inferred that a spiral embryo could not occur in *Menispermaceae*. A subsequent examination of the seed convinced me that I was quite mistaken in this conclusion, and that *Spirospermum* offers a very anomalous departure from the above-mentioned otherwise universal rule. Here, although the radicular end of the embryo remains in its normal position, its cotyledonary extremity is not directed as usual to the point of attachment of the fruit, but it wanders to some uncertain station through a helical channel. The putamen contains a single orbicular seed, which is greatly flattened and covered by a thin membranaceous integument; from a point on its periphery, just below the persistent style, and close to the basal attachment of the putamen, the cell begins to be intercepted by a thin partition, which curves spirally until it terminates in the exact centre of the seed, thus completing in its course two and a half gyrations, and the embryo is found within the spiral cell of the integument, without any albumen. This spiral division is, in fact, the condyle, which at its commencement is like that seen in *Tiliacora*, *Diploclisia*, &c. —where, terminating a little beyond the middle of the cell, it divides it into a bimarsupial or hippocrepiform pouch; but in *Spirospermum* this septiform condyle is continued far beyond that point, in an extremely attenuated state, under the form of a spiral coil, which reaches the centre in the manner before described. This septiform line is attached to the two opposite inner faces of the putamen, as in the other genera; and when a

knife is passed round the periphery of the putamen, its two flattened sides are easily torn away from the adherent edges of the condyle, leaving a corresponding helical cicatrix upon the two faces, and showing correlative grooves on the outer surfaces of the putamen. We might suppose that the embryo would fill the entire length of the helical cavity of the integument; but it was otherwise in the specimens I examined; for although this spiral cavity consisted of nearly three gyrations, the elongated slender embryo only extended through half of the first turn, the remaining two gyrations being quite empty; the radicular end, however, touched its normal point on the periphery, at the beginning of the first coil.

I have explained how the development in *Tiliacora*, *Diploclisia*, &c. takes place by the simple process of excentric growth; indeed in all the genera of the family, even in the more extreme cases just mentioned, the amount of curvature of the integument and seed is coequal and symmetrical with the unequal expansion of the ovary, and therefore of the pericarp and putamen; but in *Spirospermum* the one greatly exceeds the ratio of the other, as is shown above; and this forms a solitary exception to the otherwise general rule.

It would be instructive if we could ascertain the cause of this singular growth. In all cases the original ovular integument grows lengthwise; and in *Spirospermum* we might suppose that it grows into a very slender elongated tube within the cell of the ovary, gradually extending itself till it completes a circle, and that at that point, meeting with obstruction, it would be turned aside and carried forward in an inward spiral coil for nearly two other gyrations, terminating in the centre: in this case the entire coiling tube ought to be free; but we see the reverse; for its adjacent sides are found agglutinated together and also with the interposing spiral condyle, which has simultaneously accompanied it in its growth. By what means this is accomplished appears an enigma very difficult of explanation.

The only species of *Spirospermum* is a tree of low stature, or a shrub with pendent branches charged with large, lanceolate-oblong, coriaceous, polished, glabrous leaves, with many parallel oblique nerves, which anastomose near the margin; the petiole is short and stout: the inflorescence is a terminal panicle, twice the length of the leaves, pendent, and, with the fruit, becomes black in drying; it is copiously branched, its ultimate branches bearing, in the ♀ plant, two long fructiferous pedicels, swollen at their summit into a receptacle, which carries nine crowded stipitate drupes, all being glabrous, bractless, and black. The drupes are exsiccous, orbicular, extremely compressed, acutely

carinated on the margin, on which, close to the base, is seen the remnant of the persistent style; and on each flattened face, near the carinated margin, is a prominent ring: the putamen is thin and coriaceous, quite flat and discoid in the centre of each face, where it is marked by a spiral furrow corresponding with the line of condyle already described.

In the ♂ plant the inflorescence is in axillary panicles, which are as long as the leaves, having a slender rachis provided at each of its alternate axils with two slender branches of unequal length, all dichotomously divided, the ultimate branchlets bearing two equal 1-flowered pedicels, all quite glabrous. The flowers are small, consisting of:—six obovate sepals, in two series, the three inner being twice the length of the three outer ones; six equal oblong petals, one-third the length of the inner sepals, having their lateral margins inflexed; six stamens, in two series, the length of the petals, the three outer ones free, with slender filaments, the three inner filaments being united for half their length into a monadelphous column; each stamen provided with two free, distinct, erect anther-lobes.

**SPIROSPERMUM**, Thouars.—*Flores* dioici, ubique glabri. *Masc.*

*Sepala* 6, biseriata, obovata, fusco-nigrescentia, quorum 3 interiora duplo majora. *Petala* 6, biseriata, æqualia, oblonga, sepalis interioribus 3-plo brevioribus, lateribus inflexis. *Stamina* 6, biseriata, petalis æquilonga; *filamenta* filiformia, erecta, 3 exteriora libera, 3 altera fere ad medium in columnam centralem coalita; *antheræ* didymæ, lobis parvis, oblongis, liberis, erectis, apice paulo divaricatis, rima laterali longitudinaliter dehiscentibus.—*Fœm.* ignoti. *Drupæ* 9, supra receptaculum parvum crebriter erectæ, longiuscule stipitatæ, exsiccæ, orbiculares, valde compressæ, basin versus stylo persistente notatæ, nigræ, rugulosæ, glabræ; *putamen* sarcocarpio sicco tenaciter adherente vestitum, orbiculare, valde compressum, carina peripherica tenui latiuscula munitum, utraque facie marginem versus lira annulari prominente signatum, disco planum et sulco spirali notatum, tenuiter chartaceum; *condylus* internus, septiformis, primum angustus, demum filiformis, a basi ortus, deinde ex anfractibus 3 spiraliter convolutis in centro terminatus. *Semen* loculum implens, exalbuminosum, valde compressum; *integumentum* conforme, membranaceum, condylo spirali interseptatum: *embryo* valde elongatus, pariter teres, *radicula* basi proxima, ad stylum persistentem spectante, *cotyledonibus* linearibus accumbentibus vagis paulo brevioribus.

*Frutex* vel *suffrutex* *Madagascariensis*, crebre ramosus; rami *longi*, *teretes*, iterum *ramosissimi*, *pendentes*, *glaberrimi*, ramulis *ultimis* pedicellos 2 *unifloros* gerentibus: flores *parvi*, *glabri*.

*Spirospermum penduliflorum*, Pet. Th. Gen. Madag. p. 9. no. 63; DC. Syst. i. 515, Prodr. i. 93;—ubique glabrum, ramosum, ramis iterum ramosis, teretibus, nitentibus, pulverulento-flavidulis, striatis, axillis subapproximatis, pendulis; foliis oblongo-lanceolatis, imo rotundatis, mox paululo sensim angustioribus, apice breviter attenuatis, a basi sursum alternatim penninerviis, nervis utrinque circa 9, coriaceis, supra lucidis, pallide viridibus, subtus pallidioribus et flavescenti-glaucis, venis flavidis, nitentibus, reticulatis, marginibus cartilagineis, subrevolutis; petiolo crassiusculo, tereti, striato, limbo 12-plo brevior: panicula ♂ axillari, ramosa, pendula, folio longiore, nigrescente; rachi tenui, ramis alternis, in axillulis geminis, altero brevior, iterumque dichotome divisus, ultimis pedicellos 2 unifloros gerentibus; floribus minusculis: panicula ♀ axillari, iterumque ramosa, pendula, nigrescente, folio duplo longiore; rachi crassiuscula, ramulis tenuioribus, angulatis, dichotome divisus, ebracteatis, striatis, ultimis pedicellos 2 unifloros ferentibus; pedicellis fructiferis longiusculis, subtenuibus, apice receptaculo parvo donatis; drupis 9, crebriter erectis, stipitatis, receptaculo insitis.—In Madagascar: v. s. ♂ et ♀ in herb. Hook. (Gerard, 32).

M. Gerard calls this "a large shrub, or low tree." Its leaves are 10 inches long, 3 inches broad, on a stout petiole  $\frac{3}{4}$  inch long: in the ♂ specimen they are somewhat smaller, 5–7 inches long, 2–2 $\frac{3}{4}$  inches broad, on a more slender petiole  $\frac{3}{4}$  inch long. The ♂ panicle is 8 $\frac{1}{2}$  inches long, its axillules about 1 inch apart, the primary branches 1–2 inches long; the pedicels 1 $\frac{1}{4}$  line, the flowers in bud globular,  $\frac{1}{2}$  line in diam.; the ♀ panicle is upwards of a foot long, its primary branches very numerous and approximated; the branchlets densely crowded, laxly pendulous; the tertiary branchlets (somewhat slender, 1 $\frac{1}{2}$  inch long) bear two slender fructiferous pedicels, 1 $\frac{1}{4}$  inch long, scarcely swollen at the apex, which supports nine crowded, erect, orbicular, very compressed drupes, 6 lines in diam., each on its stipitate support 1 line long.

### 53. DETANDRA.

This genus was proposed by me, several years ago, for two plants in the herbarium of Prof. DeCandolle, both natives of the province of Bahia in Brazil; its characters were sketched more than three years since in my synopsis of the genera of the family (Ann. & Mag. Nat. Hist. ser. 3. vol. xiii. p. 124; vide *suprà*, p. 18). One of these plants, in the size, shape, and texture of its leaves, offers some resemblance to *Chondrodendron tomentosum*, R. & P., with which it also agrees in the more than usual number of its imbricately disposed sepals; but it differs



in the form of its six petals, and in having only three stamens, whose filaments are united into a central column, leaving the anthers almost sessile on its furcated summit\*; the two cells of each anther are laterally imbedded in the nearly obsolete points of the filaments, the intermediate connective being very shortly and obtusely excurrent beyond their apex; and they burst by a longitudinal suture corresponding with a narrow semiseptum, which renders them 2-locellate. We may perceive in the above peculiar characters some analogy towards *Parabæna* and *Syrrho-nema*, from which genera it differs in many respects.

I have here described two species, one of which Dr. Eichler has made a third species of his genus *Sychnosepalum*; but I have shown, under my description of the latter genus, how much dissimilarity exists between them: it differs in its habit, its subpeltate leaves, its inflorescence and the structure of its flowers. The *Somphoxylon* of the same botanist is at variance with *Detandra* only in its more expanded panicle, minute flowers, and the smaller number of its sepals (frequently an inconstant character); it agrees in the number, shape, and relative size of the petals, and exactly in its three monadelphous stamens.

The species of *Detandra* have somewhat oval, subpeltate, coriaceous, 5-nerved leaves, which are glabrous and polished above, pale and tomentose beneath, on rather slender petioles: the inflorescence is a panicle shorter than the petiole, with short alternate branches, each bearing one to three alternate pedicellated flowers; the flower has fifteen to eighteen closely imbricated sepals becoming gradually smaller externally (the upper moiety of the six interior and larger ones expanding horizontally, as in *Chondrodendron*), six petals in two series, which are oblong or lanceolate, unguiculated at the base, and entire or denticulated on the margin; the stamens are already described.

DETANDRA, nob.—*Flores* dioici. *Masc. Sepala* 14–17, in ordine ternario ad torum subcylindricum imbricatim disposita, quorum 2–5 exteriora minutissima et bracteiformia, 6 intermedia ovato-oblonga et extus pilosiora, 6 interiora cuneato-oblonga, cum apicibus rotatim reflexis, omnia extus leviter tomentella et ciliolata. *Petala* 6, biseriata, subæqualia, sepalis dimidio breviora, unguiculato-oblonga vel lanceolata, erecta, glabra. *Stamina* 3, alte monadelphia, petalis longiora; *filamenta* in columnam centralem fere ad summum coalita, apice hinc crassiuscule et brevissime trifurca; *antheræ* bilobæ, lobis

\* This feature of the agglutination of the stamens suggested the generic name, from *δερός*, *ligatus*; *άνήρ*, *mas*.

ovatis, majusculis, segregatis et in filamentum lateraliter semiimmersis, connectivo intermedio paululo excurrente, bilocellatis, 2-valvatis, rima longitudinali dehiscentibus.—*Fl. fœm. ignoti.*

Frutices *Brasilienses scandentes*; rami *striati, ad axillas cupuloso-nodosi*; folia *alterna, petiolata, subpeltata, ovata vel ovato-oblonga, imo rotundata vel sinu levi subtruncata, integra, coriacea, 5-nervia, supra glabra, subtus pallide tomentosa*: panícula *axillaris, petiolo brevior, tomentosa, alternatim ramosa, ramis brevibus, corymbuloso-paucifloris, pedicellis 2-3, fasciculatis*; flores *parvi.*

1. *Detandra latifolia*, nob. in Ann. Nat. Hist. ser. 3. xiii. 124;—racemis subflexuosis, tenuiter striatis, glabriusculis, subpeltatis, orbiculato-ovatis, imo sinu levi truncatis, summum versus rotundiusculis, apice repente et breviter attenuatis, acutis, mucronatis, integris, coriaceis, marginibus subrevolutis, e basi 5-nerviis, supra nitidis, nervis impressis, subtus alutaceo-tomentosis, nervis prominentibus, ferrugineis, marginibus paululo reflexis; petiolo tereti imo apiceque incrassato, e cupula nodosa orto, fere glabro, limbo dimidio brevior et intra ejusdem marginem affixo: paniculis ♂ 2-5, ad axillas annotinas aphyllas nodosas fasciculatis, subbrevibus, tomentosis, alternatim ramosis, ramis corymbulosis, paucifloris; floribus pedicellatis; sepalis 12 cum 2 alteris bracteiformibus, flavido-albidis, extus pubescentibus.—In Brasilia: *v. s. in herb. De-Cand., Bahia* (Blanchet).

This plant was collected by Blanchet, climbing on trees in shady forests. Its axils are about  $1\frac{1}{2}$  inch apart; the leaves are  $3\frac{1}{2}$  inches long, 3 inches broad, on a petiole  $1\frac{1}{2}$  inch long, inserted 1 line within the margin of the basal sinus, which is 1 line deep. The inflorescence is seen on a leafless stem, of much older date, where the axils have grown into irregularly knotted tubercles, out of which spring two or three panicles  $1-1\frac{1}{4}$  inch long, bare at base, branching from the middle alternately, each branch bearing one to three pedicellated flowers; the pubescent pedicels are 1 line long, the flower expanded 1 line in diameter; the bracts are smaller than the twelve sepals, in four alternate series, which are nearly equal in size, obtusely oblong, smooth inside, pubescent outside, in the inner series pubescent only on the midrib and ciliate margin; they are all imbricately fixed on the cylindrical andrœcium, which supports the petals and central column; the six biserial petals are one-third of the length of the sepals, erect, much shorter than the stamens, cuneate at base, with the apex of the claw slightly inflected, the limb flat, with denticulate margins, quite glabrous;

the three filaments are completely united into a central terete column, terminated by three fleshy connectives, slightly divaricating, upon each side of which the anther-cells are deeply imbedded, leaving the margins of the connectives excurrent; the anther-cells are globose, bursting 2-valvately by a longitudinal furrow along the edge of a semiseptum, which makes each bilocellate: this monadelphous column is as long as the unreflected portion of the sepals, the apices of which are rotately expanded, as in *Chondrodendron*.

2. *Detandra ovata*, nob. in Ann. Nat. Hist. ser. 3. xiii. p. 124; Contrib. Bot. iii. p. 18; — *Sychnosepalum microphyllum*, Eichl. in Mart. Fl. Bras. fasc. xxxviii. p. 204, tab. 44. fig. 5; — ramulis teretibus, tenuibus, flexuosis, flavido-tomentosis; foliis subpeltatis, ovalibus, imo rotundatis, apice rotundiusculis, brevissime et repente acuminatis, acute mucronatis, integris, crasso-coriaceis, marginibus revolutis, paulo supra basin 5-nerviis, nervis exterioribus mox evanidis, nervis cum alteris lateralibus utrinque 2 arcuatim nexis, supra nitidis, glaberrimis, nervis venisque immersis hinc reticulatim subrugosis, subtus pilis rubiginoso-incanis densissime tomentosus, nervis vix prominulis; petiolo tereti, imo apiceque crassiore, limbi dimidium paulo excedente, et intra marginem basalem inserto, ferrugineo-tomentoso: racemo ♂ axillari, tomentoso, petiolo brevioris, rachi inferne nuda, ultra medium floribus 5-6 alternis pedicellatis bracteolatis munita; sepalis 12, fere æqualibus, oblongis, apice reflexis, extus tomentosus, cum 5 alteris exterioribus bracteiformibus; petalis 6, lanceolatis, imo subspathulatis, erectis, sepalis paululo brevioribus, glabris; staminibus 3, fere ad apicem monadelphis, petalis fere duplo longioribus.—In Brasilia: v. s. in herb. De Cand., prov. Bahia (Blanchet, 3178 A).

This species, though different, is very analogous in all respects to that last described. Its branchlets are slender, with axils  $\frac{1}{2}$ –2 inches apart; the leaves are 2–2 $\frac{3}{4}$  inches long,  $1\frac{1}{4}$ – $1\frac{7}{8}$  inch broad, on a petiole  $1\frac{1}{8}$ – $1\frac{3}{4}$  inch long, inserted  $1\frac{1}{2}$ –2 lines within the rounded basal margin. The ♂ panicle is racemiform, springing from a gemmiform tuft in the axils of the upper and younger leaves, is  $\frac{3}{4}$  inch long, the rachis being bare below its middle and furnished above with six or seven very short branchlets, each with one to three pedicellated flowers  $\frac{1}{2}$  line in diameter in bud; the sepals, fifteen in number, resemble those of the preceding species; the petals are more lanceolate, with a spatulate claw; the union of the three filaments into a central column does not quite reach the summit, but leaves a short terminal

portion of each free and slightly divaricated; the anther-cells are imbedded laterally, as in the preceding species.

It is now fifteen years since I examined this plant, and then analyzed only a single flower, the drawings and details of which, as well as the parts themselves, are still preserved. There is a discrepancy between that analysis and the details published by Dr. Eichler, who attributes to its calyx thirty to thirty-six sepals: my drawing and memoranda show fifteen sepals, with the summits of the six more internal reflected horizontally, the rest becoming outwardly by degrees smaller, till they become one-fourth the length of the former, appearing like bracts. Fearing a mistake on my part, I applied to Prof. De Candolle, who very kindly sent me another flower of each species of *Detandra*. A careful analysis has confirmed the accuracy of my previous results, as I find fifteen sepals in one of Blanchet's plants, and eighteen in the other. Dr. Eichler's drawing is evidently taken from a terminal fragment of the plant, and agrees with the terminal portion of my drawing. That he had seen a complete specimen is proved by his description of the leaves, to which he attributes a length of only  $\frac{1}{2}$ -1 inch, instead of  $2\frac{3}{4}$  inches as they appear in my drawing: he therefore overlooked the important character of the peltate insertion of the petiole 2 lines within the border of the leaf. The habit of this plant is very different from that of his two other species of *Sychnosepalum*, one of which I have seen: the inflorescence and organization of the flower are very dissimilar; for in *Sychnosepalum*, in addition to the three monadelphous stamens, it has an outer whorl of three free stamens, and the anthers have quite another structure, to which I may add the leaves and their venation, which are of a very different character.

#### 54. SYRRHEONEMA.

This genus was proposed by me for a climbing plant having roundish cordate leaves, with a supraaxillary inflorescence, consisting of from three to six short fasciculated peduncles bearing generally three sessile flowers, which are small, with six tomentose imbricated sepals, no petals, and three stamens united for half their length into a central column\*, the free portions being nearly erect, fleshy, and semiterete, each having four distinct anther-lobes quadrately disposed and imbedded introrsely in their summits. There is some resemblance in this latter feature to the stamens of *Jateorhiza*; but the analogy extends no further.

\* Hence the generic name, from  $\sigma\upsilon\tilde{\rho}\tilde{\rho}\acute{\epsilon}\omega$ , *confuso*;  $\nu\tilde{\eta}\mu\alpha$ , *filamentum*.

The genus approaches *Detandra*, *Aristega*, and *Desmonema* in having three monadelphous stamens; but it differs from them in having no petals and in other particulars. In its inflorescence (consisting of several fasciculated, axillary, simple peduncles) it offers some analogy with *Pycnarrhena* and *Antitaxis*; but there the peduncles are 1-flowered, while here they bear from three to six crowded, sessile, very small flowers.

*SYRRHEONEMA*, nob.—*Flores* dioici. *Masc. Sepala* 9, quorum 3 exteriora minora et bracteiformia, 3 interiora majora, ovata, acuta, concava, membranacea, extus pilosa. *Petala* nulla. *Stamina* 3, sepalis longiora, monadelpha; *filamenta* ad medium in columnam centralem coalita, sursum libera, crassiuscula, fere erecta, intus plana, extus valde convexa; *antheræ* omnino introrsæ, loculis 4, parvulis, quadratim discretis, 2 inferioribus minoribus, singulis subglobosis, filamento semiimmersis, rima obliqua hiantibus.—*Fl. fœm.* ignoti.

*Suffrutex scandens insulæ Fernando Po indigenus*; ramuli *teretes, tomentosi*; folia *alterna, ovata, subcordata, 5-nervia, reticulata, subtus pubescentia*, petiolo *pubescente, limbo brevior*: pedunculi ♂ *breves, 3 vel plures, supra-axillares, fasciculati, pilosi, apice 3-4-flori*; flores *sessiles, parvi, cano pubescentes*.

*Syrrheonema fasciculatum*, nob. in Ann. Nat. Hist. ser. 3. xiii. 124; *huj. tom.* p. 18;—ramulis teretibus, retrorsum cinereo-pubescentibus; foliis rotundato-ovatis, imo breviter cordatis, ultra medium sensim angustioribus, apice repente attenuatis, mucronatis, e basi 7-nerviis, creberrime reticulatis, supra glabris, nervis exceptis puberulis, subtus sordide albescentibus, pubescentibus, nervis prominentibus; petiolo limbo dimidio brevior, valde tomentoso: pedunculis ♂ 3-6, fasciculatis, supra-axillaribus, petiolo 6-plo brevioribus, puberulis, apice floriferis; floribus 3 vel pluribus sessilibus, aggregatis, canescentibus; sepalis extus pilosis, erectis; staminibus glabris, exsertis.—In insula Fernando Po: *v. s. in herb. Hook.* ♂ (Mann, 192).

A climbing shrub, 10 feet high, with a branching stem extending to a length of 30 feet; branchlets  $2\frac{1}{2}$  lines in diameter, with internodes  $\frac{1}{2}$ – $\frac{3}{4}$  inch long; leaves  $3\frac{1}{4}$  inches long,  $2\frac{5}{8}$ – $2\frac{3}{4}$  inches broad, with a basal sinus 1–2 lines deep, on a petiole  $1\frac{1}{2}$ –2 inches long; peduncles 4 lines long; flowers oblong, 1– $1\frac{1}{2}$  line long.

##### 55. ELISSARRHENA.

On previous occasions I have alluded to the fact that when two Menispermaceous plants present themselves differing con-

siderably in their habit, especially in the nervation of their leaves, we may be nearly certain that this character will be found accompanied by some dissimilarities in their floral and seminal structure. So it has occurred with a plant from the Rio Negro, which I proposed as the type of a new genus, and named *Elissarrhena longipes* in my Synopsis of this family (Ann. & Mag. Nat. Hist. ser. 3. vol. xiii. p. 124; *vide supra*, p. 18). This species has been since described and figured by Dr. Eichler under the name of *Anomospermum grandifolium*. Its branches are fistulose, with very large leaves, upon unusually long and stiff petioles: these leaves are flaccid in texture, conspicuously 5-nerved at the base, the nerves being outwardly branched, little divaricating, extending in a nearly parallel direction for three-fourths of the length of the leaf, when they anastomose in an arching manner with the few lateral nerves which spring from the upper portion of the midrib; these nerves are all prominent and shining on both sides, as are also the very conspicuous transverse veins. In *Anomospermum*, on the contrary, the species are very lofty climbers, all the branches having a wood which is very compact and solid to the centre; the leaves are not a quarter the size of those of *Elissarrhena*, and upon shorter and slender petioles; they are coriaceous and finely reticulated, with three simple slender nervures, springing from the base, running for a short distance near the margin, and soon anastomosing with many others that spring from the midrib, so that they appear almost pinnately nerved, without the transverse veins which form so conspicuous a feature in *Elissarrhena*; or more frequently the nerves and reticulations are wholly immersed in the thick parenchyma, so that they become almost imperceptible. This extreme difference in the general appearance of the leaves is very striking. The inflorescence in *Anomospermum* is always glabrous, normally consisting of two axillary solitary flowers, each upon a pedicel the length of the petiole; but frequently upon the same plant we find in the axils a long aphyllous young branch, from which the nascent leaves have fallen away or are abortive, so that the inflorescence thus assumes the form of a very simple raceme, with two single pedicelled flowers in each axillule, and much longer than the entire leaf: the flowers are double the size, very glabrous; the petals are so very thick and compressed together that they resemble a central fleshy disk; the anthers consist of two oblong cells dorsally affixed, each cell bursting introrsely by a longitudinal fissure.

On the other hand, in *Elissarrhena* the inflorescence is very tomentose, five-sixths to nine-tenths shorter than the petiole, consisting of a peduncle with its apex separated into three very short branches and again divided, each branchlet bearing three flowers

upon pedicels so very short that they appear almost sessile; all are thus closely approximated into a corymbulose and almost globular head on the summit of the peduncle: the sepals are pubescent on both sides; the petals are of thinner texture, more separated, cuneately orbicular, with the laterally lobed margins inflexed, as in *Pycnarrhena* and *Antitaxis*, and embracing the filaments, as in the latter genus; the filaments are thick and fleshy, flat inside, very convex outside; the anther, as in *Anelasma*, is subglobose, formed of two collateral cells semiimmersed in the gibbous, incurved, clavated apex of the filament, and it opens horizontally by an introrse transverse suture into two gaping valves, each cell being rendered bilocellate by a semiseptum, as in *Anelasma*, *Antitaxis*, and *Pycnarrhena*. The flower in its structure thus most resembles that of *Anelasma*, only provided with petals—but would still more resemble that of *Antitaxis*, were it not that the floral parts are there tetramerous.

These differences are so many and so manifest that they justify the maintenance of *Elissarrhena* as a genus distinct from *Anomospermum*. I have remarked, under *Sciadotenia* (*suprà*, pp. 340, 341) the analogy that exists in several points between it and *Elissarrhena*, both from Guiana.

*ELISSARRHENA*, nob.—*Flores* dioici. *Masc.* *Sepala* 9, ternatim disposita, utrinque puberula, margine ciliata, quorum 3 exteriora bracteiformia, multo minora, 3 interiora intermediis 2-plo majora, orbiculata, concava, æstivatione imbricata, demum expansa. *Petala* 6, sepalis triplo breviora, sublobato-orbicularia, lobis lateralibus inflexis, imo cuneata, subcarnosa, glabra. *Stamina* 6, libera, æqualia, petalis opposita et unguibus affixa, illis fere duplo longiora; *filamenta* imo tenuia, subincurva, sursum gradatim incrassata, intus plana, extus convexa, summo gibboso-elavata; *antheræ* subglobosæ, introrsæ, filamentis semiimmersæ, 2-lobæ, lobis rotundiusculis, connectivo angustissimo collateraliter adnatis, singulis rima horizontali bivalvatum hiantibus.

Frutex *Brasiliensis*, *scandens*; ramuli *fistulosi*, *tomentosi*; folia *majuscula*, *oblonga*, e basi 5-nervia, nervis *conspicuis* extus *ramosis et transversim venosis*, *submembranacea*, *textura flaccida*, *glaberrima*, *longe petiolata*: paniculæ ♂ *supra-axillares*, *solitariae vel geminae*, *tomentosæ*, *petiolo* 12-plo breviores; pedunculus *ebracteatus*, *apice breviter trichotomus*, ramis *iterum divisus*, ramulis *brevissimis*, *flores* 3 fere *sessiles gerentibus*; inflorescentia *hinc corymbulosa aut fere capitata*; *flores parvi*, *adpresse pubescentes*.

*Elissarrhena longipes*, nob., Ann. Nat. Hist. ser. 3. xiii. 124; *huj.* op. iii. 18;—*Anomospermum grandifolium*, *Eichl. in Mart. Fl.*

*Bras.* xxxviii. 169, tab. 37. fig. 1 ;—ramulis crassiusculis, valde fistulosis, striatis, compressis, tomentosis ; foliis magnis, oblongis, imo obtusis aut acutioribus, sursum gradatim angustioribus, apice subacutis et mucronatis, e basi 5-nerviis, nervis extus ramosis, transversim venosis et cum aliis superioribus arcuatim nexis, textura flaccida submembranaceis, glaberrimis, supra viridibus, subtus brunnescenti-glaucis, nervis venisque utrinque prominulis, striatis et lucentibus ; petiolo tereti, striato, rigido, glabro, nitente, apice subincrassato, limbo vix brevior : paniculis ♂ supra-axillaribus, solitariis aut binis, brevissimis, tomentosis ; pedunculo ebracteato, petiolo 10-plo brevior, apice iterum trichotome corymbuloso, ramis brevibus, ramulis pedicellisque brevissimis aut fere obsoletis ; floribus parvis, pubescentibus, fere sessilibus, hinc subcapitato-approximatis.—In Guiana Brasiliana : *v. s. in herb. variis*, Rio Negro et Rio Solimões (Spruce, 1538).

This is evidently a climbing plant, with compressed fistulose branches,  $2\frac{1}{2}$ –3 lines thick, with internodes  $1\frac{1}{2}$  inch long ; the leaves are 8–11 inches long,  $4\frac{1}{2}$ – $6\frac{1}{2}$  inches broad, on a petiole  $5$ – $5\frac{1}{2}$  inches long : the peduncle of the corymbulose panicle is only 4–6 lines long, its three primary branches 1 line long, their three branchlets very short, each bearing three flowers on pedicels barely  $\frac{1}{4}$  line long ; the flower in bud is globose,  $\frac{3}{4}$  line in diameter ; its parts are arranged as stated in the generic diagnosis.

#### 56. SYNCLISIA.

This genus was established by Mr. Bentham in his ‘Genera Plantarum’ (i. 36) ; it is one of African origin and of much interest. Although nothing is known of its female flower or of its seminal structure, it is there placed in the same section as *Tiliacora* and *Abuta*, both very peculiar genera, remarkable for their seeds with deeply ruminated albumen and a very long, narrow, hippocrepiform embryo. The only apparent ground for this arrangement is the valvate æstivation of its inner whorl of sepals ; but with equal or even greater reason it might be placed among the *Pachygonea*, near another African genus, *Trichlisia*, in which the inner sepals have also a valvate æstivation and at their lower edges, though not agglutinated, adhere closely together by their tomentose margins, and the stamens are likewise partly monadelphous. Until its seed be known, it appears to me much safer to place it among the genera of doubtful position. One of its chief peculiarities is the agglutination of the inner whorl of sepals, for more than half their length, into a cylindrical 3-lobed tube, in which respect it bears some



resemblance to *Cyclea* and *Peraphora*: the six more external sepals, in two series, are much smaller, quite free, linear, and very acute. It has six minute scale-like petals, and nine stamens one-third the length of the inner sepals; of these, three are more external, free, and a trifle shorter than the other six, which are briefly monadelphous at their base, and central. The inflorescence consists of two supra-axillary very slender pedicels, double the length of the petiole, each bearing a solitary flower, which is of rather a large size for the order. In its 1-flowered axillary pedicels it therefore bears some resemblance to *Pycnarhena*, *Syrrhonema*, and *Antitaxis*. Only one species is known, which has very slender scandent branches, and distant, cordate, somewhat oval leaves, acuminate at the apex, with rather short petioles.

*SYNCLISIA*, Benth.—*Flores* dioici.—*Masc.* *Sepala* 9, subcarnosa, in seriebus 3 alternatim disposita, quorum 3 exteriora bractei-formia, 3 intermedia paulo majora, cuncta linearia, acutissima, extus longe pilosa, intus glabra, 3 interiora 4-plo majora, in tubum cylindraceum apice 3-partitum agglutinata, laciniis tubo dimidio brevioribus, una cum tubo extus glabris, erectis, subobtusis, sepalis externis 3-plo latioribus, marginibus sericeo tomentosus, æstivatione valvatim clausis. *Petala* 6, minima, sepalis interioribus 10-plo breviora, suborbicularia, imo breviter unguiculata, glabra. *Stamina* 9, quorum 3 exteriora libera, paululo breviora, 6 centralia imo in stipite breviter monadelpa, sepalis interioribus 3-plo breviora; *filamenta* paulo compressa, sursum gradatim crassiora; *antheræ* bilobæ, exteriores subintrorsæ, centrales subextrorsæ, lobis connectivo subexcurrente sejunctis, filamento fere lateraliter adnatis, rima longitudinali subobliqua dehiscentibus.—*Fl. fœm.* ignoti.

*Frutex scandens Africæ occidentalis æquinoctialis*; ramuli debiles; folia ovata, cordata, apice acuminata, imo 5-nervia, pilis sparsis munita: inflorescentia supra-axillaris, e pedicellis geminis unifloris; pedicellus petiolo 2-plo longior; flos pro ordine majusculus.

*Synclisia scabrída*, Oliv. MS.;—ramulis volubilibus, tenuibus, teretibus, vix striatis, junioribus rigide ferrugineo-puberulis, cum axillis remotiusculis; foliis obovatis, imo cordatis, apicem versus constrictis, acuminatis et longe mucronatis, e basi 5-nerviis, supra fusco-viridibus, nitentibus, ad nervos pilis longis paucis rufis munitis, valde reticulatis, subtus nervis prominentibus venisque pilosis; petiolo tenui, pilis longis rufis patentim villosis, limbo 5-plo brevioris; pedicellis ♂ ge-

minis, supra-axillaribus, tenuissimis, fere rectis, petiolo 2-plo longioribus, patentim vel retrorsum rufo-pilosis, 1-floris.— In Africa tropicali: *v. s. in herb. Hook.*, ♂, Gaboon River (Mann, 986); Congo (C. Smith).

This is a plant with slender climbing branches  $\frac{1}{3}$  line thick, with internodes  $2\frac{1}{2}$ – $3\frac{1}{2}$  inches long; leaves  $2\frac{1}{2}$ – $3\frac{1}{4}$  inches long, with a basal sinus 1–2 lines deep,  $1\frac{1}{2}$ –2 inches broad, on a petiole 6–8 lines long; the two one-flowered pedicels in each axil are very slender, nearly erect, 9 lines long; the flower is 3 lines long,  $1\frac{1}{2}$  line in diameter; the proportions of its floral parts are as stated in the generic diagnosis.

#### 57. PENIANTHUS.

Among the plants arranged under *Fibraurea* in the Hookerian herbarium, I noticed one from the island of Fernando Po, which is very different in habit, particularly in its leaves, which are not triplinerved as in that genus; its inflorescence, instead of being a very long and laxly spreading panicle, is barely half an inch long, consisting of a very short supra-axillary peduncle that supports a number of umbellated 1-flowered pedicels of half its length, all being pubescent. It is a female specimen, its flowers having nine sepals in three series diminishing in size outwards and imbricated in æstivation, six minute petals affixed by their claws to the feet of as many sterile stamens seated round a raised gynæcium which supports three short, gibbously cylindrical, pilose ovaries, almost concealed (when seen from above) by their very large sessile stigmata, which resemble those of *Calycocarpum*. Its leaves are of considerable size, lanceolately oblong, narrowing towards both extremities, and acuminate at the summit, having many parallel divergent nerves that archingly anastomose together near the margin, in which respect they offer some resemblance to *Pycnarrhena*. I know of no genus to which this plant can be referred.

PENIANTHUS, nob.—*Flores* dioici. *Masc.* ignoti.—*Fœm. Sepala* 9, alternatim in ordine ternario disposita, quorum 3 exteriora minora et bracteiformia, 3 intermedia ovata, paulo majora, glabra, 3 interiora adhuc majora, orbiculari-ovata, concava, carnosula, marginibus membranaceis, glabra, æstivatione imbricata. *Petala* 6, minima, staminibus opposita, late obovata, erecta, subcarnosula. *Stamina* 6 sterilia, libera, ovarii dimidio breviora; *filamenta* compressa, cum petalis gynæcio affixa, erecta; *anthera* 2-lobæ, apicifixæ, filamentis dimidio breviores, lobis oblongis, erectis, sine connectivo collateraliter adnatis,

lateraliter sulcatis, effœtis. *Ovaria* 3, cylindrico-ovata, gibbosa, arcte conferta, gynœcio brevi insita, pilosa, 1-locularia, *ovulo* unico angulo ventrali appenso; *stylus* nullus; *stigma* maximum, sessile, horizontaliter reflexum, depressum, radiatim 3-lobum, lobis deltoideis, margine eroso-denticulatis. Cœtera ignota.

*Frutex scandens, insulæ Fernando Po indigenus*: folia majuscula, lanceolato-oblonga, utrinque subacuta, apice attenuata, glabra, penninervia, petiolo crassiusculo, subbrevis: pedunculus ♀ supra-axillaris, petiolo 4-plo brevior, apice pedicellos circiter 7 breves bracteolatos 1-floros gerens; flores parvi.

*Penianthus longifolius*, nob. huj. op. iii. 18; Ann. Nat. Hist. ser. 3. xiii. p. 124;—ramis nitidis, ramulis teretibus, rugulosis, opacis, axillis approximatis; foliis lanceolato-oblongis, utrinque acutis, apice in acumen longum lineare obtusulum subito attenuatis, penninerviis, nervis 2 basalibus brevibus margine proximis mox evanescentibus, reliquis utrinque 9–10 parallelim divergentibus, marginem versus invicem arcuatim nexis, utrinque glaberrimis, supra læte viridibus, impresse rugulosis, nervis sulcatis, subtus pallide glaucis, nervis tenuibus prominulis, costa media carinata, marginibus tenuibus, subrevolutis; petiolo tenui, rigidulo, angulato-striato, imo apiceque tumido, glabro, limbo 7-plo brevior: pedunculo ♀ remotiuscule supra-axillari, solitario, pubescente, petiolo 4-plo brevior, apice umbellato, umbellis seu pedicellis circiter 7, pedunculo dimidio brevioribus, unifloris; flore parvo, pubescente.—In insula Fernando Po: v. s. in herb. Hook., loc. cit. (Mann, 194).

This is a peculiar plant, with much the habit of *Pycnarrhena*. The branch is 2 lines thick, with axils  $\frac{1}{2}$ –1 inch apart; the leaves are  $8\frac{1}{4}$ – $8\frac{1}{2}$  inches long,  $3$ – $3\frac{1}{4}$  inches broad, with a narrow acuminate apex 6–9 lines long and 2 lines broad, the petiole being  $1\frac{1}{8}$  inch long: the peduncle is 3–4 lines long, the umbellated pedicels 2 lines long; the flower before expansion  $\frac{1}{2}$  line in diameter.

#### 58. SELWYNIA.

This genus was founded on an Australian plant by Dr. F. Mueller, who described it in his 'Fragmenta,' iv. 153. It is evidently a climber, with slender branches, furnished with shining, glabrous, lanceolate leaves, somewhat acute at both extremities, 3-nerved as well as triplinerved at base, reticulated, and upon slender petioles. The ♂ inflorescence is axillary, paniculate, on a slender divaricated rachis half as long again as the

leaves, with alternate, long, spreading branches, each again with alternate short branchlets bearing from five to seven others, which support from one to three sessile flowers on their apex: the flower consists of from eight to ten sepals, all orbicular, very concave, glabrous, the outer two ciliated on the margin, smaller than the others, which are subequal, submembranaceous, and much imbricated; it has from eight to ten petals, half the size of the sepals, cuneately oblong, with the lateral margins inflected and embracing the stamens, subfleshy; from eight to ten stamens the length of the petals and affixed to their claw, with 2-lobed introrse anthers, the lobes dorsally and collaterally adnate to the filament, each bursting by a longitudinal furrow. I have had no opportunity of seeing either the female flower or the fruit; but Dr. Mueller states that it bears three drupes (one or two sometimes abortive), subglobose and stipitate, enclosing a hard putamen of similar shape, rounded dorsally, somewhat compressed on its faces, the condyle being internal and intruding, thus rendering the cell hippocrepical and 4-locellate by a monstrous expansion of the intruding condyle—a formation which it is difficult to understand: the seed is said to be hippocrepiform, but whether with or without albumen is not stated, nor is the shape of the embryo known. The genus must for the present therefore be referred to the section made to include those of doubtful position.

SELWYNIA, F. Mueller.—*Flores* dioici. *Masc. Sepala* 8–10, orbicularia, valde concava, glabra, submembranacea, quorum 2–4 exteriora minora, margine ciliata, 6 interiora duplo majora, subæqualia, decussatim imbricata, omnino lævia. *Petala* 8–10, sepalis dimidio breviora, cuneato-oblonga, sepalis opposita, æquilonga, in unguibus iis affixa; *filamenta* subcomplanata, sursum gradatim latiora; *antheræ* introrsæ, filamentis dorso adnatæ, 2-lobæ, lobis oblongis, collateraliter affixis, lateribus profunde sulcatis, in sulcis 2-valvatim dehiscentibus.—*Fœm. Flos* ignotus. *Drupæ* 3, vel abortu pauciores, subglobosæ, imo stipitatæ, basim versus stylo persistente signatæ: *putamen* durum, subglobosum, dorso convexum, in faciebus subcompressum, loculo hippocrepiformi; *condylus* internus, intra loculum longe intrusus. *Semen* hippocrepiforme. Cætera ignota.

*Frutex scandens Australiæ orientalis intertropicæ*; ramuli teretes, tenues; folia ovato-lanceolata, imo 3-nervia et triplinervia, longe tenuiter petiolata: panicula ♂ axillaris, glabra, folio multo longior, divaricato-ramosa, bracteolata, ramis alternis, iterum ramulosis, ramulis ultimis 5–7, apice flores 1–3 sessiles gerentibus: inflorescentia ♀ simpliciter racemosa.

*Selwynia laurina*, F. Muel. Fragm. iv. 153;—ramulis lignosis, teneribus, teretibus, subtiliter striolatis, glabris; foliis ovato-lanceolatis, utrinque acutiusculis, apice obtusulis, imo 3-nerviis simulque triplinerviis, nervis simplicibus, margine subparallelis cum aliis paucis ultra medium ortis invicem arcuatim nexis, valde reticulatis, utrinque glaberrimis, supra viridibus, nitentibus, subtus concoloribus, nervis venisque prominulis, marginibus cartilagineis; petiolo tenui, apice paulo crassiore, ruguloso, striolato, glabro, limbo 4-5-plo brevior: panicula axillari, glabra, folio paulo longiore, longe ramosa, ramis longiusculis, alternatim iterum breviter ramulosis, ramulis ultimis 5-7, apice 1-3-floris; floribus sessilibus, parvis, glabris: racemis ♀ simplicibus; drupis carnosis, rubris.—In Australia orientali: *v. s. in herb. Hook.* ♂, Rockingham Bay (F. Mueller).

The branches are slender, with internodes 1-2 inches long; the leaves are  $2\frac{1}{2}$ - $4\frac{1}{2}$  inches long,  $1\frac{1}{4}$ - $1\frac{3}{4}$  inch broad, on a petiole 8-10 lines long: the rachis of the axillary panicle is  $5\frac{1}{2}$  inches long, with about eight alternate primary branches 2 inches long, diminishing upwards, the (three to seven) alternate secondary branches, about 3-6 lines long, bearing on their apex from one to three sessile flowers, about  $\frac{1}{2}$  line in diam. in bud. The drupes are said to be reddish and shining, about 5 lines in diameter.

#### 59. ARISTEGA.

This genus is proposed for a plant in the Hookerian herbarium, obtained from the Collection of the East-India Company, and registered as from the Helford herbarium: no locality is stated; but it may be presumed to be of Indian origin. It has ovate leaves, rounded at the base, acuminate at the summit, 3-nerved as well as triplinerved, the nerves extending beyond the middle and archingly anastomosing with the few other lateral nerves; the petiole is short and slender. The inflorescence consists of two or more raceme-like panicles which spring out of the knotty axils of the leafless old branches; in these the rachis is slender, longer than the leaves, furnished sparsely with short branches again branched, the branchlets supporting from one to three pedicellated flowers, all bracteolated at the articulations and rigidly pubescent; the flowers have nine sepals in three series, alternately smaller, the outer bracteiform, the intermediate somewhat larger, the three inner ones double the length of the former, nearly orbicular, very concave, thick, with their margins valvate in æstivation; they have three petals, smaller than the sepals, fleshy, cuneately oblong, subconcave, emarginated at the

apex, having as many free stamens fixed to their claws; the filaments, nearly as long as the petals, become much broader and flattened towards the apex, to which two distinct divaricately separated anther-lobes are dorsally affixed and partially imbedded, the lobes bursting introrsely by a longitudinal furrow. Here the chief peculiarity consists in the valvate æstivation of its orbicular fleshy inner sepals, in which respect it resembles *Tiliacora*, *Abuta*, *Anelasma*, *Limacia*, *Trichisia*, and *Synclisia*. From the first and fourth it differs in having only three free stamens, from the second and third in the presence of petals, from the fifth in its stamens being only three in number with three petals, and from the last in its sepals being orbicular and free to the base, not oblong and united for half their length into a tube: other differential features exist, which may be seen by comparing the respective generic characters. This valvate character of its stamens suggested the generic name\*.

ARISTEGA, nob.—*Flores* dioici. *Masc. Sepala* 9, in ordine ternario alternatim disposita, extus gradatim minora, quorum 6 exteriora bracteiformia, ovata, carnosula, præter margines tenuiores longe piloso-ciliatos glabra, 3 interiora dimidio majora, suborbicularia, valde concava, apice inflexa, carnosula, marginibus crassis, æstivatione arcte valvata, glabra. *Petalata* 3, sepalis tertia parte breviora, alterna, cuneato-oblonga, apice emarginata, canaliculatim concava, carnosula, glabra, staminibus paulo breviora et opposita. *Stamina* 3, libera; *filamenta* unguibus petalorum affixa, sursum gradatim latiora, crassiuscula, apice dilatata et rotundata; *anthera* 2-lobæ, introrsæ, dorso semiimmersæ, lobis oblongis, segregatis, imo paulo divaricatis, utrinque sulco longitudinali dehiscentibus.

*Frutex scandens, origine ignoto, sed verisimiliter ex India orientali: folia ovata, acute attenuata, 5-nervia, reticulata, glaberrima, petiolo brevi et tenui: paniculæ ♂ racemiformes, solitariae aut geminae, e nodis aphyllis annotinis ortæ, folii circa longitudine, ramis approximatis brevibus, iterum ramulosis, ramulis brevissimis, pedicellos 1-3 unifloros gerentibus.*

*Aristega lævifolia*, nob.;—ramulis validiusculis, glabris; foliis ovatis, imo rotundatis, apicem versus breviter constrictis et acuminatis, acutis nervis 5, e basi enatis, cum aliis paucis ultra medium alternatim ortis, arcuatim nexis, valde reticulatis, viridibus, utrinque glabris; petiolo tenui, limbo 5-plo brevior: paniculis ♂ racemosis, sæpius binis, e nodis annotinis aphyllis axillaribus, folio brevioribus, rigide puberulis, axillellis approximatis, bracteolatis; ramis brevibus; ramulis brevissimis,

\* From ἀρι, valde; στέγω, tego.

1-3-floris, floribus brevissime pedicellatis.—In India orientali (?): *v. s. in herb. Hook. ex museo Soc. Ind. orient. (herb. Helford).*

The branchlets are 1-2 lines thick, the axils 1-1½ inch apart; the leaves are 3-3¾ inches long, 1¾-2¼ inches broad, on a petiole 5-7 lines long. On the same sheet a separate leaf is glued, which hardly seems to belong to the specimen: it is lanceolate, acute at both ends, 3¾ inch long, nearly 1½ inch broad, on a petiole 8 lines long; it is 3-nerved at base. The twin racemose panicles growing out of the leafless axils of the old branch have a slender rachis 2½-3½ inches long, with bracteoles 2 lines apart, from which one or more (generally two) branches spring, which are 2-3 lines long, each bearing three flowers on extremely short pedicels; the flowers are less than half a line in diameter in bud.

#### 60. DESMONEMA.

This genus is proposed for a plant from Natal, with cordate, deltoidly orbicular, submembranaceous, glabrous, 5-nerved leaves, the nerves branching externally, the petiole being long and slender. It has an axillary inflorescence, with a somewhat slender rachis as long as, or longer than, the leaves, the whole plant so much resembling a species of *Tinospora* that it might easily be mistaken for one. The inflorescence is a simple raceme, its rachis being provided at short intervals with a subulate bracteole half the length of the 1-flowered pedicel which emanates from the same point; the flower has six sepals, which are ovate, subacute, the three outer being alternate with and half the length of the three interior; six petals in two series, the outer ones subcuneately ovate, three-quarters of the length of the inner sepals, plane, the three inner ones a trifle shorter, linear, one-third their breadth, fuscous, subfleshy, longitudinally canaliculated; three monadelphous stamens as long as the outer petals, the filaments being united for three-quarters of their length into a central column, the upper extremities being free, nearly erect, supporting as many subglobular anthers, which are broader than they, 2-celled, the oval cells collateral, without intervening connective, each cell opening bivalvately by a somewhat lateral and subextrorse longitudinal furrow. *Desmonema*, in the feature of its three monadelphous stamens, resembles *Rhaponema*, *Syrrhonema*, *Detandra*, and *Sarcopetalum*. It differs from the first in its subextrorse anthers, in the number and shape of its sepals, the kind of its inflorescence, the form and venation of its leaves, and its very dissimilar habit. *Syrrhonema*

differs from it in its introrse 4-lobed anthers, the want of petals, the greater number of its sepals, and in the character of its inflorescence. *Detandra* is distinct from it in its anther-cells, a far greater number of sepals, the character of its inflorescence, its petate leaves, with another kind of venation. *Sarcopetalum* also differs in the number and form of its sepals, and in the globular shape of its larger fleshy petals.

DESMONEMA, nob.—*Flores* dioici. *Masc. Sepala* 6, biseriata, oblonga aut subovata, submembranacea, nervose picta, glabra, 3 interiora exterioribus 2-plo longiora et 3-plo latiora, æstivatione imbricata. *Petala* 6, biseriata, quorum 3 exteriora cuneato-ovata, submembranacea, plana aut subconcava, sepalis dimidio breviora, 3 interiora paululo breviora, 3-plo angustiora, linearia, erecta, fusco-carnosula, longitudinaliter canaliculata. *Stamina* 3, monadelphia, petalis æquilonga; *filamenta* longe ultra medium in columnam centralem coadunata, summo libera, complanata, suberecta; *antheræ* subglobosæ, conniventes, apicifixæ, 2-lobæ, lobis sulco laterali subextrorsum et bivalvatim dehiscentibus.

*Frutex scandens Africa australis, habitu fere* Tinosporæ; *folia deltoideo-orbicularia, cordata, obtusa, e basi 5-nervia, nervis extus ramosis, glabra, membranacea, longiuscule petiolata*: racemus ♂ simplex, supra-axillaris, folio sublongior, glaber; *rachis gracilis, remotiuscule bracteolata*; *pedicellus bracteola 2-plo longior, 1-florus*; *flos parvus*.

*Desmonema Caffra*, nob.;—scandens, ramulis subtenuibus, angulato-compressis, striolatis, glabris; foliis subcordato-orbicularibus, subdeltoideis, ultra medium sensim angustioribus, apice rotundatis, subito constrictis et breviter mucronatis, hinc canaliculatis deflexis, e basi 5-7-nerviis, nervis extus ramosis et marginem versus arcuatim nexis, reticulatis, membranaceis, utrinque glabris, supra pallide viridibus, subtus glauco-pallidioribus, marginibus nervo cartilagineo munitis et subrevolutis; petiolo tenui, striato, glabro, limbo dimidio brevior: racemo ♂ simplici, supra-axillari, glabro, folio fere 2-plo longiore; rachi tenui, bracteolata, bracteis lineari-subulatis, subreflexis, pedicello filiformi 2-plo longiore 1-floro comitatis; floribus parvis, glabris.—In Africa australi: *v. s. in herb. Hook., Natal* (Gerard, 1976).

The axils are  $1\frac{1}{2}$  inch apart; the leaves are  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches long,  $2\frac{1}{4}$ – $2\frac{3}{4}$  inches wide, with a broad sinus 3–5 lines deep, on a petiole  $1\frac{1}{4}$  inch long. The inflorescence is  $3\frac{1}{2}$ –5 inches long, simply racemose; the setaceous bracts are  $\frac{3}{4}$  line long, 3–4 lines



apart, or more rarely so closely approximated as to be nearly opposite; the pedicels are  $1\frac{1}{2}$ –2 lines long, and support a single flower, which is  $\frac{1}{2}$  line in diameter before expansion.

#### 61. RHAPTONEMA.

The plant here described is a native of Madagascar, and the type of a new genus now proposed. It is a shrub of low growth, with straight, somewhat slender, tomentose branchlets, with oblong leaves having alternate nerves which anastomose everywhere with one another at short intervals, making thus a large areolar network of veins which gives them a very peculiar appearance; they are subpilose above, sulcate along the midrib, furnished beneath with a yellowish pubescence, the petiole being somewhat short and pubescent. The ♂ inflorescence is a raceme-like panicle, which springs from the axils of the young upper leaves, and is therefore almost terminal; the somewhat slender rachis, which is covered with yellowish pubescence, is about half the length of the ordinary leaves, having rather distant, very short branches, with still shorter branchlets, which bear from one to three flowers at their apex; the flower is small, consisting of nine equal spatulately linear sepals, rounded at their apex, in three alternate series; six petals, in two series, equal, rather more than half the length of the sepals, oblong, narrowing at each extremity, plane and glabrous; three stamens somewhat shorter than the petals, united for two-thirds of their length into a central column, leaving their extremities free, somewhat divaricated, broad, compressed, bearing two anther-cells at their apex inside, which are dorsally attached, collateral, separated by a narrow space, each opening introrsely by a longitudinal furrow.

The genus agrees with *Desmonema* in its three monadelphous stamens, but differs in their anthers being quite introrse, in having nine equal sepals, in its more compound raceme, in the very distinct character of its leaves, and a completely dissimilar habit. It differs also from other genera with three monadelphous stamens by the characters enumerated under *Desmonema*.

RHAPTONEMA, nob.—*Flores* dioici. *Masc. Sepala* 9, in ordine ternario alternatim disposita, spathulato-oblonga, æqualia, membranacea, extus pilosa, intus glabra, æstivatione imbricata, demum rotatim expansa. *Petala* 6, biseriata, oblonga, subacuta, sepalis fere tertia parte breviora, plana, submembranacea, glabra, nervo medio fusco signata. *Stamina* 3, monadelpha, petalorum longitudine; *filamenta* ultra medium in columnam centralem coalita, sursum libera, complanata, paulo

divaricata; *antheræ* omnino introrsæ, dorso adnatæ, 2-lobæ, lobis ovatis, paulo dissitis, parallelis, sulco longitudinali dehiscentibus.

*Suffrutex Madagascariensis, subhumilis, ramosus*; ramuli *subtenuis, tomentosi*; folia *oblonga, imo rotundata, apice obtusa, penninervia, nervis inter se ubique anastomosantibus, hinc grosse reticulatis, supra subpilosa, subtus pubescentia*, petiolo *tenui, subbrevis*: paniculis ♂ *racemosis, in axillis supremis solitariis, hinc fere terminalibus, ramis brevibus, alternatis*, flores 1-3 *brevissime pedicellatos gerentibus*; flos *parvus*.

*Rhaptonema cancellata*, nob.;—ramulis teretibus, ferrugineo-tomentosis; foliis oblongis, imo rotundatis, apice obtusis et cuspidato-mucronatis, penninerviis, nervis plurimis, inter se ubique anastomosantibus, hinc cancellato-reticulatis, supra dense viridibus, subpilis, in costa media nervisque sulcatis, subtus præsertim in nervis valde prominentibus ferrugineo-pubescentibus; petiolo subtenui, pubescente, limbo 8-plo brevior: paniculis ♂ *racemosis, in axillis superioribus solitariis, hinc fere terminalibus*; rachi tomentosa, ramis subpaucis, brevibus, alternis, flores 1-3 *brevissime pedicellatos apice gerentibus*; sepalis 9, expansis, subæqualibus, 6 exterioribus extus pilosis, 3 interioribus ad nervum medianum pubescentibus.—In Madagascar: *v. s. in herb. Hook., Madagascar* (Gerard, 18).

This is said to be a shrub 4 feet high or more. It has somewhat slender tomentose branchlets, with axils 1-2 inches apart; the leaves are conspicuous for their peculiar nervation, 3-4 inches long,  $1\frac{1}{2}$ - $1\frac{3}{4}$  inch broad, on a petiole 5-6 lines long; the axillary racemose panicle is  $1\frac{1}{2}$  inch long, its alternate branchlets,  $1\frac{1}{2}$ -2 lines apart, are 1-2 lines long, each supporting about three flowers,  $1\frac{1}{2}$  line in diameter when expanded, and upon very short pedicels.

## 62. SOMPHOXYLON.

This genus was established by Dr. Eichler, in Martius's 'Flora Brasiliensis,' upon a scandent plant from Dutch Guiana; but its characters are not all fully known. One of its peculiarities, which suggested its generic name, is that its wood is extremely soft and spongy. Its leaves are rather large, 6-9 inches long, 4-7 $\frac{1}{2}$  inches broad, on a petiole 4 inches long, somewhat penninerved and glabrous. The ♂ inflorescence is a widely spreading panicle, 2 feet long,  $1\frac{1}{2}$  foot broad, with its branches horizontally patent and gradually decreasing upwards;

these are again and again divided, by branchlets standing at right angles with each other, all elongated, the last series being very slender, 1-1½ inch long, furnished at close bracteolated intervals with three or four fasciculated minute flowers on very short pedicels. The habit of the plant is therefore very peculiar. The flower consists of six concave ovate sepals in two series, the outer being very briefly connate at base, the inner equal, alternate, and free; six fleshy petals somewhat shorter, obovate, in two series, the inner plane, the outer ones alternate, with their lateral margins inflected; three monadelphous stamens, whose filaments are united for three-quarters of their length into a central column, their apices free, each bearing two separated anther-lobes, adnate by their side and back to the filament, and bursting somewhat extrorsely by a longitudinal furrow. It will be seen that *Elissarrhena* and *Sciadotenia*, both from Guiana, have leaves similar in size and shape to those of *Somphoxylon*, and have also soft-wooded fistulose branches, thus offering a general resemblance; but the very expanded and peculiar inflorescence of the latter and the structure of its flower remove all further analogy. There is no evidence in the character of the plant that can indicate the tribe to which the genus belongs.

*SOMPHOXYLON*, Eichler;—*Flores* dioici. *Masc. Sepala* 6, biserialia, alterna, concava, glabra, quorum 3 exteriora ovato-lanceolata, dimidio breviora, inter se basi breviter connata, 3 interiora late obovata. *Petala* 6, biseriata, sepalis dimidio breviora, obovato-elliptica, carnosula, 3 interiora plana, 3 exteriora alterna, lateribus inflexis. *Stamina* 3, monadelphia; *filamenta* crassiuscula, pro majore parte in columnam centralem coalita; *antheræ* majusculæ, ad dorsum et latera filamenti adnatæ, 2-lobæ, lobis subglobosis, dissitis, singulis sulco longitudinali subextrorsum dehiscentibus.

Frutex *Guianæ Batavianæ glaberrimus*, ligno mollissimo sub-spongioso; folia majuscula, oblonga vel ovata, imo subcordata, apice repente cuspidata, penninervia, concoloria, petiolata: panicula ♂ magna, late ramosa, bracteolata, ramis longis patentim divaricatis, sursum decrescentibus, iterum bis patentim expansis, ramulis tertiariis longiusculis, gracilibus, axillulis approximatis, flores 3-4 brevissime pedicellatos gerentibus; flores minimi, glabri.

*Somphoxylon Wellschlagelii*, Eichl. in Mart. Fl. Bras. xxxviii. p. 206, tab. 37. fig. 4;—glaberrimum; ramulis teretibus, haud striatis, spongiosis, cortice lucidulo, demum cinerascens-rubido, lenticellato; foliis ovatis vel cordato-ovatis, apice re-

penne cuspidatis, penninerviis, nervis basalibus palmatis, lateralibus utrinque 5-8, membranaceis, concoloribus, reticulatis, subtus nervis prominulis; petiolo utrinque parum incrassato, limbo dimidio brevior: panicula ♂ axillari, glaberrima, magna, iterum iterumque divisa, amplissime et late expansa, ramis ramulisque bracteolatis, patentissimis, sursum decrescentibus, tertiariis gracilibus, spicatis, axillulis bracteolatis, approximatis, flores 3-4 fasciculatos brevissime pedicellatos gerentibus; floribus minimis.—In Surinamo, ad Paramaribo.

This plant is quite unknown to me, the above characters being derived from Dr. Eichler's description and from a portion of the inflorescence which he has figured. The leaves are 6-9 inches long, 4-7½ inches broad, on a petiole 4 inches long. The panicle is 24 inches long; its rachis is round and stout; the primary branches 9 inches long, very straight, spreading out expansively, 2 lines thick, diminishing upwards gradually in length, with the secondary branchlets ½-¾ inch apart, and more than 3 inches long; the tertiary branchlets, also straight, and spreading at right angles, 3 lines apart and 1-1½ inch long, with bracteoles 1 line distant, and which bear in their axillules three or four flowers, ½ line in diameter, upon very short pedicels.

### 63. DISCIPHANIA.

This is another genus of Dr. Eichler's, described in Martius's 'Flora Brasiliensis,' the type being a plant from the river Amazonas, which bears a very strong resemblance to a *Jateorhiza*. It is a climbing plant, strigosely pilose in every part, with somewhat ovate leaves, deeply cordate, leaving a broad sinus between two rounded basal lobes, and divided at the summit into three almost parallel lanceolate-oblong segments; they are 5-7-nerved at base, on a petiole three-fourths of the length of the blade. It has one or two supra-axillary racemes with a slender rachis as long as the petiole, very pilose, spicated, with many alternate, approximated, sessile flowers; each flower rises out of a small pilose bract, is glabrous, depressed-globose or subtrigonus in the bud; it has six equal sepals in two series, which are subequal, elliptic, and membranaceous; six equal petals, much shorter than the sepals, the three exterior twice the breadth of the three inner ones, all extremely thick and fleshy, closely compacted and depressed into a subtrigonoid form, leaving a hollow in the centre for the stamens, which thus appear sunk within a fleshy disk, nearly as in *Anomospermum*: in the centre are three free stamens, with almost obsolete filaments, each having a broad

fleshy connective bearing two oval separated anther-cells dorsally adnate upon it, and each bursting introrsely by a longitudinal furrow. The position of the genus is yet quite uncertain. Dr. Eichler places it near *Tinospora*, probably on account of the resemblance of its leaves to those of *Jateorhiza*: it differs from it and all the genera of the *Heteroclinae* in having only three stamens; in the monadelphous character of the stamens it resembles *Chasmanthera*, *Parabæna*, and *Odontocarya*, belonging to that tribe, which have six united filaments; while in its three monadelphous stamens it approaches *Sarcopetalum*, *Detandra*, *Syrrhonema*, *Rhaptonema*, *Desmonema*, and *Somphoxylon*.

**DISCIPHANIA**, Eichl.—*Flores* dioici. *Masc. Sepala* 6, biserialia, subæqualia, elliptica, membranacea, glabra. *Petala* 6, multo breviora, biseriata, 3 interiora paulo angustiora, omnia crassissime carnosa, valde depressa, compacta, et discum trigonoideum mentientia. *Stamina* 3, centralia, libera; *filamenta* brevissima, fere obsoleta, in connectivum latum carnosum expansa; *antheræ* 2-lobæ, lobis segregatis, ovatis, dorso semiimmersis, singulis rima longitudinali introrsum dehiscentibus.

*Frutex Brasiliæ septentrionalis scandens, undique strigoso-pilosus; folia subovata, profunde cordata, apice inciso-trilobata, lobis lanceolato-oblongis, e basi 5-nervia, petiolo limbo brevior: racemus ♂ axillaris, valde hirsutus, petiolo longior; flores in axillulis bracteolatis approximatis sessiles, pro ordine majusculi, glabri.*

*Disciphania lobata*, Eichl. in Mart. Fl. Bras. xxxviii. p. 169, tab. 36. fig. 1;—*Cocculus lobatus*, Mart. Obs. MSS. n. 2803;—caule superne herbaceo, tereti, valide 10–12-striato, pilis longis ferrugineis hirto-villoso; foliis ovato-oblongis, imo profunde cordatis, lobis basalibus rotundatis, a medio sursum 3-lobatis, lobis adscendentibus, lanceolato-oblongis, acuminatis, e basi 5–7-nerviis, nervis extus ramosis, laxe reticulatis, tenuiter membranaceis (siccis pellucidis), utrinque, præsertim subtus in nervis, pilis longis adpressis strigoso-hirsutis, marginibus villosis-ciliatis; petiolo tenui, apice crassiore, longe villosa, limbo paulo brevior: racemis ♂ supra-axillaribus, binis, dense spicatis, petiolo dimidio longioribus, siccis nigrescentibus; rachi tenui, patentim villosa, crebriflora, axillulis approximatis, bracteolatis, unifloris; bracteolis parvis, subulatis, hirsutis, apice densius barbatis; floribus sessilibus, glabris; sepalis expansis, rotato-patentibus, petalis 4-plo longioribus.—In Brasilia Amazonica, ad Manaos (Barra do Rio Negro).

I have not seen this plant, which is very peculiar in its habit.

In its incised leaves it somewhat resembles *Jateorhiza*, *Calyccarpum*, and *Menispermum*, the former more especially in its long strigose pubescence; in the compression of its six thick fleshy petals into a shape somewhat like a trigonoid disk, it approaches *Anomospermum*. The branch is very flexuose, with axils  $6\frac{1}{2}$  inches apart; the leaves are  $7\frac{1}{2}$  inches long,  $5\frac{1}{4}$  inches broad, with a rounded basal sinus  $\frac{3}{4}$ – $1\frac{1}{2}$  inch deep, leaving two rounded basal lobes; from the middle upwards they are divided into three lobes, with a narrow very acute sinus between them, the middle lobe being  $4\frac{1}{2}$  inches long, 2 inches broad, the two lateral lobes, of the same breadth, are  $2\frac{1}{2}$  inches long; the petiole is 4 inches long; the spicated raceme is 6–7 inches long or more; the bracts are 1 line long; the flower expanded is 3 lines in diameter.

#### 64. QUINIO.

This genus was proposed by Schlechtendal in 1853 (Linnæa, xxvi. 732) for an Indian plant received from Hohenacker, respecting which much doubt has existed. It was referred by the former botanist to the *Menispermaceæ*; but, as its floral parts are pentamerous, it has been rejected from the order by most authorities. Notwithstanding this decision, I entertain no doubt that it is a truly Menispermaceous plant; and, before explaining the reasons for this opinion, I will recapitulate its characters as recorded by Schlechtendal. It is entirely glabrous, its branches sulcately striated and black; its leaves alternate, transversely suborbicular, cordate at base, retuse and mucronated at the summit, 5-nerved, the nerves branching externally, glaucous beneath, 2 inches long,  $2\frac{1}{2}$  inches broad, on a petiole 4 inches long, which is swollen at base and articulated upon the stem, almost palately geniculated with the limb at the junction of the nerves. It has a very elongated racemose panicle, with a black rachis 10 or 12 inches long, with alternate spreading branches  $2\frac{1}{2}$  inches long, bearing at their summit several branchlets, often so much approximated as to appear almost umbelliform, each bearing from one to three flowers obsoletely pedicellated: the glabrous flower consists of five imbricated, obovate, concave sepals, which are maculated in interrupted longitudinal lines; it has five petals somewhat shorter and narrower than they, spathulately rhomboid, with their lateral margins lobulated and inflexed; five stamens opposite to and somewhat longer than they, and affixed to their claws, bearing on their apex two minute effete anther-cells, slightly divaricated at base; in the centre are three distinct ovaries, ovate, very gibbous, each containing a single ovule, and surmounted by a short style with a very thick dilated stigma.

It will readily be seen that all these minutely detailed characters agree precisely with those of *Diploclisia inclyta*, except the number of sepals, petals, and stamens, which here are five, instead of six. It may be inferred, therefore, that Schlectendal, when drawing up his diagnosis, was misled by examining a flower in which one of these parts, which are very caducous, had fallen away; and this seems clearly proved by the following circumstances. Schlectendal states that Hohenacker's plant, on which he founded his genus, came from the province of Canara, on the south-western coast of the Indian peninsula. Now in the Hookerian herbarium I found a plant of Hohenacker's from Mangalore, in Canara, which I carefully examined, and ascertained that its flowers are hexamerous, agreeing in every character with other specimens of *Diploclisia inclyta*: it is also a ♀ plant, according with Schlectendal's description not only in the size and form of the leaves, but in the length of the inflorescence, the distance and length of its primary branches, its almost umbellate branchlets, the markings of the sepals, and the shape of the petals and sterile stamens. It appears to me that there is not the slightest doubt of their absolute identity; and I therefore think that the genus should be suppressed, and that *Quinio cocculoides*, Schl., should stand as a synonym of *Diploclisia inclyta*, as suggested on a former occasion (*ante*, p. 283).





## M O N E N D A.

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As the descriptions of all the species described in this volume, amounting to 332, were printed at interrupted periods, and at the times when the introductory remarks on the respective genera were published in the 'Annals of Natural History,' it will be useful to add, in the shape of footnotes, the following references, recording the several dates of their publication:—

Page	1. Menispermaceæ, Ann. Nat. Hist. ser. 3. vol. xiii. page	1.	Jan. 1864.
"	16. Synopsis,	122.	Feb. 1864.
"	19. Coscinium,	125.	"
"	24. Calycocarpum,	130.	"
"	26. Jateorhiza,	132.	"
"	29. Tinospora,	315.	Apr. 1864.
"	37. Chasmanthera,	486.	June 1864.
"	39. Fibraurea,	487.	"
"	44. Tinomisium,	489.	"
"	46. Burasaia,	490.	"
"	49. Anamirta,	vol. xiv. page 49.	July 1864.
"	56. Parabæna,	51.	"
"	57. Aspidocarya,	52.	"
"	59. Odontocarya,	97.	Aug. 1864.
"	65. Rhigiocarya,	100.	"
"	67. Anomospermum,	101.	"
"	74. Tiliacora,	252.	Oct. 1864.
"	79. Abuta,	254.	"
"	92. Anelasma,	259.	"
"	100. Hypserpa,	363.	Nov. 1864.
"	107. Limacia,	365.	"
"	113. Menispermum,	367.	"
"	116. Pericampylus,	369.	"
"	122. Pselium,	371.	"
"	124. Heocarpus,	372.	"
"	126. Homocnemia,	373.	"
"	127. Cissampelos,	vol. xvii. page 128.	Feb. 1866.
"	198. Antizoma,	265.	Apr. 1866.
"	201. Dissopetalum,	267.	"
"	204. Clypea,	268.	"
"	210. Stephania,	vol. xviii. page 12.	July 1866.
"	233. Clambus,	16.	"
"	234. Cyclea,	17.	"
"	245. Peraphora,	20.	"
"	247. Perichasma,	21.	"

Page 249.	Cocculus,	Ann. Nat. Hist. ser. 3. vol. xix. page 19.	Jan. 1867.
„ 259.	Nepbroica,	„ „ „ 24.	„
„ 269.	Holopeira,	„ „ „ 27.	„
„ 278.	Diploclisia,	„ „ „ 85.	Feb. 1867.
„ 285.	Tristichocalyx,	„ „ „ 87.	„
„ 287.	Legnophora,	„ „ „ 88.	„
„ 289.	Sarcopetalum,	„ „ „ 90.	„
„ 292.	Hyperbæna,	„ „ „ 92.	„
„ 307.	Chondrodendron,	„ „ „ 187.	March 1867.
„ 319.	Sychnosepalum,	„ „ „ 192.	„
„ 323.	Hæmatocarpus,	„ „ „ 194.	„
„ 328.	Pachygone,	„ „ „ 319.	May 1867.
„ 335.	Pleiogyne,	„ „ „ 322.	„
„ 338.	Microclisia,	„ „ „ 324.	„
„ 340.	Sciadotenia,	„ „ „ 225.	„
„ 345.	Triclisia,	„ „ „ 328.	„
„ 351.	Pycnarrhena,	„ „ „ vol. xx. page 11.	July 1867.
„ 354.	Antitaxis,	„ „ „ 12.	„
„ 359.	Spirospermum,	„ „ „ 14.	„
„ 362.	Detandra,	„ „ „ 17.	„
„ 366.	Syrrheonema,	„ „ „ 19.	„
„ 367.	Elissarrhena,	„ „ „ 167.	Sept. 1867.
„ 370.	Synclisia,	„ „ „ 170.	„
„ 372.	Penianthus,	„ „ „ 171.	„
„ 373.	Selwynia,	„ „ „ 172.	„
„ 375.	Aristega,	„ „ „ 173.	„
„ 377.	Desmonema,	„ „ „ 260.	Oct. 1867.
„ 379.	Rhaptoneuma,	„ „ „ 261.	„
„ 380.	Somphoxylon,	„ „ „ 262.	„
„ 382.	Disciphania,	„ „ „ 264.	„

## CORRECTIONS AND ADDITIONS.

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- Page 3, line 4, for pedicillated read pedicellated  
 „ 3, line 33, erase and *Quinium*  
 „ 3, line 37, for *Rhaptomeris* read *Cyclea*  
 „ 4, line 13, for *Syrrhonema* read *Syrrheonema*  
 „ 17, lines 7 and 8 to be erased.  
 „ „ line 10, for 18 read 17  
 „ „ line 17, for 19 read 18  
 „ „ line 18, for 20 read 19  
 „ „ line 28, for 21 read 20  
 „ „ line 30, for 22 read 21  
 „ „ line 31, for 23 read 22  
 „ „ line 32, for 24 read 23  
 „ „ line 33, for 25 read 24  
 „ „ line 38, for 26 read 25  
 „ „ line 40, for 27 read 26  
 „ „ after line 40 insert:—  
     ♂ ut in *Cissampel.* ♀ Pet. 2 . . . . . 27. *Dissopetalum.*  
 „ „ after line 48 insert:—  
     ♂ Cal. glob. 4-5-dent. Pet. 0. Anth. 4-5-loc.  
       peltat. coalitæ . . . . . 32. *Peraphora.*  
     ♂ Sepal. 6, libera. Pet. 3. Anth. glob. 1-loc.  
       opercul. . . . . 33. *Perichasma.*  
 „ 18, line 4, for 32 read 34  
 „ „ line 6, for 33 read 35  
 „ „ line 8, for 34 read 36  
 „ „ line 10, for 35 read 37  
 „ „ after line 10 insert:—  
     ♂ Pet. 6, cuneat. Stam. 6, libera. ♀ Condyl.  
       lateral. intrus. . . . . 38. *Tristichocalyx.*  
     ♂ Pet. 6, squamif. ♀ Putam. squamis fimbriat.  
       munit. Condyl. lateral. intern. . . . . 39. *Legnephora.*  
     ♂ Pet. 3-5, scrotif. Stam. 3, monadelp. ♀ Ovar.  
       3-6. Condyl. lateral. intrus. . . . . 40. *Sarcopetalum.*

- Page 18, line 17, for 36 read 41  
 „ „ line 18, after Petal. 6, insert Stam. 6, libera.  
 „ „ line 19, for 37 read 42  
 „ „ after line 19 interline :—  
     ♂ Petal. 6. Stam. 6, monadelp. ♀ Ovar. 6. Co-  
     tyled. hippocr. Condyl. septiform. . . . . 43. *Sychnosepalum*.  
 „ „ line 20, for ignota read 6. Stam. 6, filam. galeat.  
 „ „ line 21, for 38 read 44  
 „ „ line 23, for 39 read 45  
 „ „ line 24, for Petal. 6 read Sepal. 6. Petal. 0  
 „ „ line 25, for 40 read 46  
 „ „ after line 25 interline :—  
     ♂ Sepal. 15. Petal. 0. ♀ Cotyled. cycl. Condyl.  
     umbonif. . . . . 47. *Microclisia*.  
 „ „ line 27, for 41 read 48  
 „ „ line 29, for 42 read 49  
 „ „ line 31, for 43 read 50  
 „ „ lines 32 and 33 to be erased; see above, “40. *Sarcopetalum*.”  
 „ „ after line 33, interline :—  
     ♂ Sepal. 8, decussat. Petal. 2. ♀ Drup. 3. Co-  
     tyled. renif. globos. Condyl. intern. . . . . 51. *Antitaxis*.  
     ♂ Sepal. 6. Petal. 6. ♀ Drup. 9, compress. Co-  
     tyled. teret. spiral. Condyl. spiral. . . . . 52. *Spirospermum*.  
 „ „ line 35, for 45 read 53.  
 „ „ line 37, for 46. *Syrrhonema* read 54. *Syrrheonema*  
 „ „ lines 38 and 39 to be erased; see above, “51. *Antitaxis*.”  
 „ „ line 41, for 48 read 55  
 „ „ lines 42 and 43 to be erased as belonging to *Hæmatocarpus*.  
 „ „ line 45, for 50 read 56  
 „ „ line 47, for 51 read 57  
 „ „ after line 47 interline :—  
     Sepal 8–10. Petal. 8–10. Stam. 8–10, libera.  
     Anth. 2-lob. . . . . 58. *Selwynia*.  
     Sepal. 9. Petal. 3. Stam. 3, libera. Anth. 2-lob. 59. *Aristega*.  
     Sepal. 6. Petal. 6. Stam. 3, monadelp. Anth.  
     2-lob. . . . . 60. *Desmonema*.  
     Sepal. 9. Petal. 6. Stam. 3, monadelp. Anth.  
     lob. 2, dissit. . . . . 61. *Rhaptonema*.  
     Sepal. 6. ext. imo connat. Petal. 6. Stam. 3, mo-  
     nadelp. . . . . 62. *Somphoxylon*.  
     Sepal. 6. Petal. 6, crasso-carnos. Stam. 3, libera. 63. *Disciphania*.  
 „ „ line 48 to be erased, as it belongs to *Diploclisia*.  
 „ „ line 53, add Is a synonym of *Hæmatocarpus comptus*.  
 „ 19, line 5, cancel the remarks about *Spirospermum*, as it has since been found to be  
 a true Menispermaceous genus (see *antè*, page 359).  
 „ 21, line 1, for *Syrrhonema* read *Syrrheonema*

- Page 21, line 42, *for brevissima read brevi*  
 „ 25, line 17, *erase brevi serrata*  
 „ 38, line 27, *erase cetera ignota and substitute* :—*Semen loculo conforme meniscoideum, ventre cavum; integumentum, albumen embryoque iis Tinosporæ simillima.*  
 „ 47, line 37, *after rectus; introduce* :—*albumen 2-laminare, lamina dorsali tenui, simplici, ventrali crassiore et in rugas plurimas transversas profunde ruminata.*  
 „ 48, after line 20 *add* :—From specimens of the fruit since obtained, I am able to give the more complete analysis shown in Plate 95. The drupes are 9 lines long, 6 lines in diameter, on a short stipitate support.  
 „ 49, line 2, *for eighteen read eight*  
 „ 56, after line 33 *add* :—After the foregoing remarks were printed, I obtained specimens of perfect fruit collected in Assam by Griffiths.  
 „ 57, line 12, *erase Cetera ignota. and add* :—*integumentum tenuissimum, raphe longitudinali ventrali paulo brevior signatum; embryo paulo convexus, intra albumen meniscoideum copiosum simplex sub-bilamellare inclusus, cotyledonibus tenuiter foliaceis, ovato-oblongis, valde divaricatum sejunctis, radícula triplo brevior, tereti, supera, ad axin inclinata et ad stylum spectante.*  
 „ 57, line 42, *add* :—The drupes are gibbously ovate, 4 lines long; the putamen is  $2\frac{1}{2}$  lines long, nearly orbicular and meniscoid. Their structure is shown in Plate 98.  
 „ 63, line 23, *after 97 add* :—*Chondodendron tomentosum Eichl. (non R. & P.) in Mart. Fl. Bras. fasc. xxxviii. p. 167, tab. 42. fig. 4;—Odontocarya filipendula, nob. huj. op. p. 65.*  
 „ 64, line 27, after 47 insert *Eichl. loc. cit. p. 167.*  
 „ 65, line 26, after 748 add *Eichl. in Mart. Fl. Bras. fasc. xxxviii. p. 183, tab. 42. fig. 4.*  
 „ 65, after line 41 *add* :—  
 The drawing of this plant given by Dr. Eichler confirms the inference that it is a species of *Odontocarya*, apparently identical with my *O. tamoides*, which I found in the same province. The tuberous roots are used medicinally under the name of *Abuta miuda*.  
 „ 73, after last line *add* :—  
 7. *Anomospermum Japurense*, Eichl. in Mart. Fl. Bras. fasc. xxxviii. p. 170, tab. 37. fig. 2;—*Cocculus Japurensis*, Mart. Bot. Zeit. xxiv., App. p. 24; Walp. Rep. ii. 748.—This is a distinct species, from the River Japuré, of which only the male plant is described.  
 8. *Anomospermum reticulatum*, Eichl. l. c. p. 171, tab. 37. fig. 3;—*Cocculus reticulatus*, Mart. Bot. Zeit. xxiv., Append. 44; Walp. Rep. ii. 748;—*Hyperbæna reticulata*, Benth. Proc. Linn. Soc. v. 2<sup>o</sup> Suppl. 50.—In Amazonas, ad fluv. Japuré.—This plant of von Martius is correctly referred to *Anomospermum* by Dr. Eichler, and is the same which Mr. Bentham too hastily used as a synonym for my *Hyperbæna graciliflora*, *H. Moricandia*, *H. Hostmanni*, *H. Mexicana*, and *H. valida* collectively, though all good species; while, on the other hand, all these same species were referred by Dr. Eichler to an Asiatic genus under the name of *Pachygone Domingensis* (my *Hyperbæna Domingensis*),—thus causing, on both hands, great confusion and a number of useless synonyms.  
 „ 75, in last line, *erase siccitate and substitute et hinc*  
 „ 82, line 13, for *pubere* read *pubescente*  
 „ 82, line 24, for *racemosa* read *rufescens*

- Page 84, after line 17 *introduce*:—*Eichl.* (non *Aubl. nec DC.*) in *Mart. Fl. Bras.* fasc. xxxviii. p. 176, tab. 40. fig. 1.
- „ 85, after line 17 *add*:—Dr. Eichler's drawing, above cited, imperfectly corresponds with Sagot's specimen, which I have seen; for the leaves in that plate are much smaller, narrower in proportion, and upon more slender petioles, being  $3\frac{1}{4}$ –4 inches long,  $2\frac{3}{8}$ – $2\frac{1}{2}$  inches broad, on a petiole 2– $3\frac{1}{2}$  inches long. My details were obtained from a ♂ plant (Sagot, 1264). Dr. Eichler described a ♀ plant (Sagot sine num°).
- „ 86, line 19, after 140 *add*:—*Abuta rufescens*, *Eichl.* (non *Aubl. nec DC.*) in *Mart. Fl. Bras.* fasc. xxxviii. p. 174;—*Cocculus Pahnii*, *Mart. Fl. Ratisb.* xxiv., *App.* 45; *Walp. Rep.* ii. p. 749;—*Abuta scandens*, *Barr. Fr. Equin.* 1.
- „ 87, after line 2 *add*:—Guillemin's specimen from Rio de Janeiro, cited by Dr. Eichler, belongs to this species; but the others, from Pará and Guiana, referred here by him, have been described by me as *A. barbata* and *A. Candollei*, nob. (*antè*, pp. 83 and 84).
- „ 87, lines 25 and 26, *erase* *utrinque acutis*, and *substitute* *imo obtusis vel rotundatis*, and *after* *apice* *read* *subito acutis et*
- „ 87, line 37, after ♂ *add* et ♀ and after Spruce *insert* 2340
- „ 88, after last line *add*:—
- 9\*. *Abuta? candicans*, Rich. in DC. Prodr. i. 103; *Eichl.* in *Mart. Fl. Bras.* fasc. xxxviii. p. 177;—*Cocculus dichroa*, *Mart. Fl. Ratisb.* xxiv., *App.* 45; *Walp. Rep.* i. 749.—Nothing is known of its inflorescence; and it is uncertain whether it belongs to this genus or to *Chondrodendron*.
- „ 89, first line, after Imene, *add*:—*Eichl.* in *Mart. Fl. Bras.* fasc. xxxviii. p. 177, tab. 41. fig. 2;
- „ 89, line 11, after genus *add*:—but it does not belong to the section *Batschia*, where Dr. Eichler places it; he refers to it three specimens from the Rio Negro, Spruce, 1058, 1418, 2493. From the description, it is probably the female plant of my *Abuta rigida* (*suprà*, p. 88).
- „ 91, line 25, after 49 *add*:—*Abuta Panurensis*, *Eichl.* in *Mart. Fl. Bras.* fasc. xxxviii. p. 182, tab. 42. fig. 3.
- „ 94, line 2, after 49 *insert*:—*Eichl.* in *Mart. Fl. Bras.* fasc. xxxviii. p. 180.
- „ 96, line 9, after (non *Pöpp.*) *insert*:—*Abuta Guianensis*, *Eichl.* in *Mart. Fl. Bras.* fasc. xxxviii. p. 181, tab. 42. fig. 2.
- „ 97, line 1, after 49 *interline*:—*Abuta Sellowiana*, *Eichl.* in *Mart. Fl. Bras.* fasc. xxxviii. p. 178.
- „ 97, line 26, after (non *Pöpp.*) *insert*:—*Eichl. l. c.* p. 181.
- „ 98, after line 6 *insert*:—*Eichl.* (non *Pöpp.*) in *Mart. Fl. Bras.* fasc. xxxviii. p. 180;—*Cocculus urophyllus*, *Mart. Eichl. l. c.* p. 181.
- „ 99, after line 40 *add*:—From the citation of Dr. Eichler, in *Mart. Fl. Bras. l. c.* p. 181, this would seem to belong to my *Anelasma pallidum* (*antè*, p. 98).
- „ 100, line 10, for *minutiflorum* *read* *Hostmanni*.
- „ 116, after line 21 *add*:—
3. *Menispermum enneandrum*, nob.;—*Cocculus enneandra*, *Eichl.* in *Mart. Flor. Bras.* fasc. xxxviii. p. 184, tab. 42. fig. 5;—*Menispermum*, sp., *R. & P.*;—ramulis griseo-villosulis; foliis ovatis, cordatis vel hastato-trilobis, basi truncatis et aperte cordatis, apice obtusiusculis, mucronulatis, membranaceis, subquintuplinerviis, subtus petioloque griseo-villosulis; racemis ♂ petiolo brevioribus, ramulis paucifloris; sepalis 6, quorum 3 exterioribus triplo

brevioribus et 4-plo angustioribus, pilosulis, interioribus ovatis, subacutis, extus imo puberulis, membranaceis, subdenticulatis; petalis 6, cuneato-oblongis, medio auriculatis et inflexis, stamina amplectentibus; staminibus 9, triseriatis, quorum 6 ad unguem petalorum affixis, 3 interioribus brevioribus, liberis; antheris sub-2-4-lobis.—In Mexico?

I have alluded to this plant (see page 252), which Dr. Eichler considers nearly identical with *Cocculus Carolinus*, from which, as shown by his floral analysis, it differs in having only 6 (not 9) sepals, in its petals being lobed in the middle (not auriculate at the base), and in having 9 (not 6) stamens. In other respects it accords with *Menispermum Canadense*, which has also lobed leaves; but they are quite glabrous, while here they are pubescent beneath. Dr. Eichler does not say whether the leaves are palmate or subpeltate, probably the latter, from being quintuplinerved. He states that the plant is from Peru; but it is more likely from Mexico, whence Pavon's distributed specimens were nearly all derived, and which are generally assumed to be of Peruvian origin, because no localities are ever given.

- Page 117, line 23, for laterali read transversali  
 „ 123, line 22, for *Syrrhonema* read *Syrrheonema*  
 „ 123, line 32, for transversali read laterali  
 „ 126, line 26, for *Pleocardus* read *Pleocarpus*  
 „ 127, line 11, before tomentosus insert lanato-  
 „ 149, line 27, after floriferis insert :—racemis ♀ solitariis, axillaribus, petiolo longioribus, imbricato-bracteatis  
 „ 151, line 39, for Goudor read Goudot  
 „ 200, line 4, after tomentosus insert inflorescentia præcedentis; anthera 10-loba.  
 „ 206, line 3, after *putamen* erase both the remainder and line 4, and substitute :—obovatum, valde compressum, peripheriam versus hippocrepicum, lirisque plurimis radiatis mucronatis armatum; condylus excentralis, laminiformis, imperforatus: semen illo *Cissampelidis* simillimum.  
 „ 206, line 24, for apice dilatato substitute summo dilatatum expansis  
 „ 206, line 35, after flowers insert agglomerated together  
 „ 207, after line 22 add :—The flowers are distinct, upon very short pedicels, and, as in the following species, each manifesting the proper number of floral parts.  
 „ 210, to line 38 add :—and a single row of ridged lines radiate from it, as in the preceding species, and as in *C. Forsteri*.  
 „ 234, after line 32 add :—

The peculiar appearance of this plant little accords with the usual habit of the *Menispermaceæ*, and might induce a suspicion that it belongs to *Euphorbiaceæ*, as it bears some resemblance to *Phyllanthus glaucescens*, from Mexico (DC. Prodr. xv. p. 374), which agrees with it in its large leaves and its spreading axillary inflorescence, the ultimate branchlets of which bear numerous spicated minute flowers, each having 6 sepals and 6 small scales around the base of its 3 monadelphous stamens. There exist, however, several essential differences between them. In Kunth's plant the flowers are decidedly monœcious; the 6 scales, considered a divided disk, are alternate with the segments of the calyx; and the 2-celled anthers are distinct, with longitudinal dehiscence. On the other hand, in *Clambus*, the male inflorescence is not accompanied by female flowers; the 6 scales, which I consider to be petals, are not alternate but opposite to as many distinct sepals; and the three

2-lobed anthers are agglutinated upon a peltate connective. These circumstances show that *Clambus*, especially on account of the relative position of its sepals and petals, cannot belong to *Euphorbiaceæ*, and must find its place in *Menispermaceæ*. That it is truly a Menispermaceous plant is incontestably proved by a cross section of its branch, which exhibits a wood composed of medullary rays, easily divisible into laminæ, extending from the centre to the circumference in a single series—a structure almost peculiar to this family.

Page 255, line 30, after *terminalibus* place a comma instead of a semicolon.

„ 283, line 18, for 1 line read 2 lines

„ 288, last line, for *internus* substitute *excentralis*

„ 289, first line, for *scuto externo multo brevior, vacuus, clausus* read *scutiformis, utrinque concavus, imperforatus.*

„ 294, line 37, after *3-nerviis*, insert *sursumque penninerviis* et

„ 297, line 2, remove the comma following *folio* and place it before it.

„ 297, after line 21 interline:—

The *Cocculus reticulatus*, Mart., has been described by Dr. Eichler, since the above was printed, under the name of *Anomospermum reticulatum*, Eichl., and figured in Mart. Flor. Bras. fasc. xxxviii. p. 171, tab. 37. fig. 3.

„ 300, last line, for *lateralibus* substitute *penninerviis*

„ 318, line 15, after 200 insert:—*Pachygone Domingensis Eichl. (in parte) in Mart. Fl. Bras. fasc. xxxviii. p. 197.*

„ 320, after line 36 insert:—

Dr. Eichler refers to this genus the *Cocculus Cotoneaster*, DC. Prodr. i. 98, Deless. Icon. i. tab. 93, a plant which belongs to the *Compositæ*, the *Proustia oblongifolia*, Don, as I have elsewhere shown.

„ 324, line 20, after *fleshy*, insert the three inner ones

„ 324, line 40, after *membranaceis*, insert *quorum 3 interiora*,

„ 333, line 13, for *hebephyllus* read *hebephylla*

„ 334, line 8, for *spinuloso-* read *scabridulo-*

„ 347, line 15, for *et convexus* substitute *breviter transversus et plicatim laminiiformis*

„ 350, line 30, after *et* insert in

„ 350, line 32, for *formantibus* read *e floribus 3 evolutis*

„ 364, line 13, after *glabriusculis* insert; *foliis*

„ 366, line 18, after *had* insert *not*

„ 371, line 20, erase *una*

„ 374, line 29, after *oblonga* erase *sepalis* and substitute:—*Stamina 8-10, libera; petalis*

„ 376, line 16, for *stamens* read *sepals*

„ 376, line 38, after *acutis* place a comma.

„ 377, line 40, for *Syrrhonema* read *Syrrheonema*

„ 378, line 26, for *Caffra* read *Caffrum*

„ 380, line 11, for *cancellata* read *cancellatum*

„ 383, line 11, for *Syrrhonema* read *Syrrheonema*



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# DESCRIPTION OF THE PLATES

## IN VOLUME III.

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### PLATE 88.—*COSCINIUM FENESTRATUM*.

A portion of a male plant in flower, and of a female plant in fruit.

*Fig. 1*, a head of sessile flowers on one of the branches of the inflorescence. *Fig. 2*, a single male flower: *both nat. size*. *Fig. 3*, a flower expanded, *magnified*. *Fig. 4*, the two basal bracts. *Fig. 5*, the outer series of three sepals. *Fig. 6*, the three intermediate sepals. *Fig. 7*, the three inner sepals, in different positions. *Fig. 8*, a transverse section of one of the sepals, to show its fleshy substance. *Fig. 9*, the six stamens, three of them being free, the others monadelphous: *all magnified to the same scale*. *Fig. 10*, the three monadelphous stamens, showing the points of attachment of the others to the base of the central column. *Fig. 11*, the three free stamens: *all more magnified*. *Fig. 12*, a fruit on its stipitate support, *nat. size*. *Fig. 13*, the same, with half the pericarp removed. *Fig. 14*, the putamen, seen sideways. *Fig. 15*, the same, viewed on the dorsal side. *Fig. 16*, a longitudinal section of the same, showing the thickness of its substance, the internal condyle to which the seed is attached, and one of the external channels leading into it. *Fig. 17*, a transverse section of the same, showing the two channels from the exterior into the interior of the condyle. *Fig. 18*, the seed separated from the putamen, showing the large vacuity on its ventral face, moulded round the condyle. *Fig. 19*, the same, viewed laterally, showing the complicated fissures of the ruminated albumen, into which the plicatures of the attenuated integument are insinuated. *Fig. 20*, a longitudinal section of the same, showing the two portions of the albumen, the inner thick and ruminated by innumerable fissures, the outer thin and homogeneous, the embryo being imbedded and concealed between them. *Fig. 21*, a transverse section illustrating the same. *Fig. 22*, the embryo separated, showing the small superior radicle and the two divaricating lacinated cotyledons: *all nat. size*. *Fig. 23* is a *magnified view of fig. 21*. *Fig. 24* is the embryo *magnified*. *Fig. 25* is a transverse section of the stem of the plant, to show the peculiar arrangement of the medullary rays in the wood.

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## PLATE 89.—CALYCOCARPUM LYONI.

A portion of the male plant in flower, and of the female plant in fruit.

*Fig. 1*, a single male expanded flower on its pedicel, *nat. size*. *Fig. 2*, the same, *magnified*. *Fig. 3*, the exterior bracteiform sepals. *Fig. 4*, the six internal sepals in two alternate series. *Fig. 5*, the twelve stamens in four series, the six shorter ones opposite to the sepals, the other six longer and alternate with them: *all equally magnified*. *Fig. 6*, some of the same, seen in different positions, *more magnified*. *Fig. 7*, a single female flower on its pedicel, *nat. size*. *Fig. 8*, the three outer sepals. *Fig. 9*, the three inner alternate sepals. *Fig. 10*, the six petals, opposite to the sepals. *Fig. 11*, the six sterile stamens, opposite to the petals: *all equally magnified*. *Fig. 12*, one of the sterile stamens, *more magnified*. *Fig. 13*, one of the three ovaries upon the gynæcium, from which the others have been removed, exhibiting some of the stamens, a petal, and a sepal, in order to show their relative positions round the base of the gynæcium. *Fig. 14*, the stigma, seen from above: *both more magnified*. *Fig. 15*, a fruit, *nat. size*. *Fig. 16*, the same, with half of the pericarp cut away transversely to show the enclosed putamen. *Fig. 17*, the putamen, seen on its dorsal side. *Fig. 18*, the same, seen on its ventral side, showing the hollow space between the teeth. *Fig. 19*, a side view of the same. *Fig. 20*, a transverse section of the same, showing the longitudinal carina which encloses the chord of nourishing-vessels on the ventral side. *Fig. 21*, a longitudinal section of the same, showing the line of the condyle and of the carina, to which the inner integument is attached by the line of its raphe. *Fig. 22*, the seed, covered by its membranaceous integument, seen on its dorsal side. *Fig. 23*, the same, seen on its ventral side, faintly showing the line of the raphe. *Fig. 24*, the same, seen edgeways. *Fig. 25*, a longitudinal section of the same, showing the position of the embryo imbedded in the homogeneous albumen beneath its thin stratum on the dorsal side. *Fig. 26*, a transverse section of the same. *Fig. 27*, the same, with the thin stratum of albumen on the dorsal side removed to expose the cavity in which the embryo is imbedded. *Fig. 28*, the embryo removed, with the cotyledons further separated to show their form.

## PLATE 90.—JATEORHIZA CALUMBA.

A portion of a branch with male flowers, and an analysis of its fruit.

*Fig. 1*, a flower before expansion, on its pedicel. *Fig. 2*, the same expanded. *Fig. 3*, the three outer sepals. *Fig. 4*, the three inner sepals. *Fig. 5*, the six petals. *Fig. 6*, the six free stamens: *all nat. size*. *Fig. 7*, the three outer sepals. *Fig. 8*, the three inner sepals. *Fig. 9*, the six petals. *Fig. 10*, the six stamens, in different positions, before and after dehiscence: *all magnified to the same scale*. *Fig. 11*, one of the fruits, on the receptacle of the pedicel, from which the two others have been removed, *nat. size*. *Fig. 12*, the same, seen on its dorsal side. *Fig. 13*, the same, with half of the pericarp removed. *Fig. 14*, the putamen, freed from its pericarp and covered with dense tomentum, seen on the dorsal side. *Fig. 15*, the same, seen laterally. *Fig. 16*, the same, seen on the ventral face, which is glabrous and flattened, and where it is concave about the condyle. *Fig. 17*, the same, shown on the dorsal face, with the upper moiety of the thick tomentous covering removed, and exposing the tuberculated surface of the putamen. *Fig. 18*, the putamen, on the dorsal side, with the whole of its pubescence removed. *Fig. 19*, a side view of the same. *Fig. 20*, the same, seen on its ventral face. *Fig. 21*, a longitudinal section of the shell of the putamen. *Fig. 22*, the seed extracted from the same,

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covered by its integument. *Fig. 23*, a side view of the same. *Fig. 24*, the same, shown on its ventral face, with the cavity where it is attached to the condyle, and showing the fissures of the ruminated albumen. *Fig. 25*, a longitudinal section of the same, showing the albumen thick and ruminated on the ventral side, and very thin and homogeneous on the opposite face, beneath which the embryo is imbedded. *Fig. 26*, a transverse section of the same, to show more clearly the same structure. *Fig. 27*, the embryo removed, with the divaricated cotyledons in their natural position, and the small superior radicle: *all nat. size.*

PLATE 91.—*TINOSPORA CORDIFOLIA.*

A portion of a branch of the male plant in flower, and of a female plant in fruit.

*Fig. 1*, a male flower expanded, *nat. size.* *Fig. 2*, the three outer sepals. *Fig. 3*, the three inner sepals. *Fig. 4*, the six petals, embracing the base of the six stamens, shown in different positions: *all equally magnified.* *Fig. 5*, a female flower expanded, *nat. size.* *Fig. 6*, the three outer sepals. *Fig. 7*, the three inner sepals. *Fig. 8*, the six petals, with the six sterile stamens seated at their base: *all equally magnified.* *Fig. 9*, a female flower on its bracteated pedicel, showing the relative positions of the sepals, petals, stamens, and ovaries, *magnified.* *Fig. 10*, the same, with the sepals, petals, and stamens removed, showing the three ovaries seated upon the gynæcium, and leaving a petal and stamen at its base to indicate their relative positions. *Fig. 11*, a longitudinal section of an ovary, showing the form of the stigma and the mode of attachment of the ovule, *more magnified.* *Fig. 12*, a fruit, *nat. size.* *Fig. 13*, the putamen, with the pericarp removed, seen on its dorsal face, showing the marginal suture by which it may, without difficulty, be split into two valves. *Fig. 14*, the same, seen on its ventral face, showing the broad aperture leading into the hollow condyle. *Fig. 15*, a lateral view of the putamen: *all nat. size.* *Fig. 16*, a drupe, *magnified.* *Fig. 17*, the putamen seen on its dorsal face, showing its tubercular surface. *Fig. 18*, the same, viewed laterally. *Fig. 19*, the same, on its ventral face. *Fig. 20*, a longitudinal section of the putamen, showing the hollow condyle and the aperture leading into it. *Fig. 21*, a transverse section of the same. *Fig. 22*, the seed, covered by its very thin integument, shown on its dorsal face. *Fig. 23*, a view of the same upon its ventral face, showing the large hollow that is fitted round the condyle and the longitudinal line of raphe by which it is attached to it, and the transversally corrugated surface of the inner ruminated portion of the albumen. *Fig. 24*, a lateral view of the seed. *Fig. 25*, a longitudinal section of the same, showing the transverse furrows of the ruminated inner side of the albumen and the external thin plate of simple albumen which covers the imbedded embryo. *Fig. 26*, a transverse section of the same. *Fig. 27*, the albumen, with its external thin plate of albumen removed to show the shape and position of the enclosed embryo. *Fig. 28*, the embryo removed, showing the divaricated cotyledons and the radicle: *all magnified to the same scale.*

PLATE 92.—*CHASMATHERA DEPENDENS.*

A portion of a branch of the male plant in flower, and of the female plant in fruit.

*Fig. 1*, a flower on its pedicel, before expansion, *nat. size.* *Fig. 2*, the three outer sepals. *Fig. 3*, the three inner sepals, smooth internally and pilose outside, with ciliated margins. *Fig. 4*, the three inner petals. *Fig. 5*, the three outer petals. *Fig. 6*, a transverse section of a petal, showing its inner prominent longitudinal keel. *Fig. 7*, the six

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monadelphous stamens: *all magnified to the same scale.* *Fig. 8*, the upper portion of three of the stamens before and after dehiscence, seen on the back, side, and front, *more magnified.* *Fig. 9*, a fruit, *nat. size.* *Fig. 10*, a putamen deprived of its pericarp. *Fig. 11*, the same, showing the sutural line on its dorsal face, *magnified.* *Fig. 12*, a lateral view of the same. *Fig. 13*, the same on its ventral face, showing the aperture leading into the condyle. *Fig. 14*, a longitudinal section of the same by its sutural line, showing the hollow condyle. *Fig. 15*, a transverse section of the same, showing the form of the condyle. *Fig. 16*, a ventral and lateral view of the seed, showing a structure similar to that of *Tinospora.* *Fig. 17*, a transverse section of the same. *Fig. 18*, a longitudinal section of the same. *Fig. 19*, a dorsal view of the same, with the thin plate of albumen removed, showing the position and shape of the enclosed embryo. *Fig. 20*, the embryo removed, with its divaricated cotyledons: *all magnified to the same scale.*

PLATE 93.—FIBRAUREA CHLOROLEUCA.

A portion of a male branch in flower, and of a female plant in fruit.

*Fig. 1*, a male flower before expansion. *Fig. 2*, the six outer sepals, in two series. *Fig. 3*, the six inner sepals, in two series. *Fig. 4*, the stamens: *all nat. size.* *Fig. 5*, the six outer sepals, *magnified.* *Fig. 6*, the three intermediate sepals. *Fig. 7*, the three inner sepals, seen in different positions. *Fig. 8*, the six erect free stamens. *Fig. 9*, the same, seen in different positions, showing the petals closely agglutinated to the filaments, hiding them and partly concealing the base of the anthers: *all magnified.* *Fig. 10*, a female flower before expansion, *nat. size.* *Fig. 11*, the three outer sepals. *Fig. 12*, the three intermediate sepals. *Fig. 13*, the three inner sepals. *Fig. 14*, the six petals: *all equally magnified.* *Fig. 15*, a drupe, *nat. size.* *Fig. 16*, the putamen deprived of its pericarp, seen on its dorsal face. *Fig. 17*, the same, viewed laterally. *Fig. 18*, the same on its ventral face, showing the linear hollow channel of the condyle. *Fig. 19*, a longitudinal section of the putamen. *Fig. 20*, a transverse section of the same, showing the depth and shape of the condyle. *Fig. 21*, the seed, seen on its ventral face, showing the hollow channel which embraces the condyle and the fissures of the ruminated albumen. *Fig. 22*, a side view of the same. *Fig. 23*, a transverse section of the same, showing the position of the embryo. *Fig. 24*, a dorsal view of the same, with the thin stratum of simple albumen removed, showing the shape and size of the enclosed embryo, with its divaricated cotyledons: *all nat. size.*

PLATE 94.—TINOMISCIVM PETIOLARE.

A portion of a flowering branch of the male plant, and another of the female plant in fruit.

*Fig. 1*, the six outer sepals. *Fig. 2*, the six inner sepals in two series. *Fig. 3*, the six petals, also biserial. *Fig. 4*, the six stamens: *all nat. size.* *Fig. 5*, the six outer sepals. *Fig. 6*, the six inner sepals, in different positions, externally scabridulous. *Fig. 7*, the six petals with inflected margins. *Fig. 8*, the six stamens, before and after dehiscence, shown in different positions: *all equally magnified.* *Fig. 9*, a drupe on its stipitiated support, *nat. size.* *Fig. 10*, the same, viewed sideways. *Fig. 11*, the putamen deprived of its pericarp, seen on its dorsal side, and tuberculated all over. *Fig. 12*, the same, viewed laterally. *Fig. 13*, the same, on its ventral face, showing the narrow linear

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condyle. *Fig. 14*, a longitudinal section of the same, indicating the sulcated line of condyle on the inside of the ventral face, corresponding with the raphe of the seminal integument. *Fig. 15*, a transverse section of the same. *Fig. 16*, the seed with its integument, shown on the dorsal face. *Fig. 17*, the same, seen on the ventral face, showing the line of raphe insinuated into the groove of the condyle. *Fig. 18*, a lateral view of the same. *Fig. 19*, a transverse section of the same. *Fig. 20*, the same, with the thin stratum of simple albumen removed from the dorsal face, showing the size and shape of the imbedded embryo, with its divaricated cotyledons as they appeared in the incomplete seed: *all nat. size.*

PLATE 95.—BURASAIA CONGESTA.

A portion of a male flowering branch, and another of a female plant of BURASAIA MADAGASCARIENSIS in fruit.

*Fig. 1*, a male flower on its pedicel, before expansion, *nat. size.* *Fig. 2*, the two external sepals. *Fig. 3*, the three intermediate sepals. *Fig. 4*, the three internal sepals. *Fig. 5*, the three external petals. *Fig. 6*, the three internal petals. *Fig. 7*, the six stamens: *all magnified to the same scale.* *Fig. 8*, three of the stamens, in different positions, before and after dehiscence, *more magnified.* *Fig. 9*, two of the three drupes, shown upon their common pedicel, each on its stipitate support. *Fig. 10*, the other drupe separated. *Fig. 11*, a putamen, deprived of its pericarp, seen on the ventral face, with the aperture leading into the hollow condyle. *Fig. 12*, a lateral view of the same. *Fig. 13*, the same, on its dorsal face, and covered all over with a papillose thick tomentum. *Fig. 14*, a longitudinal section of the same, showing the hollow intruding condyle. *Fig. 15*, the seed, viewed laterally. *Fig. 16*, the same, covered with its thin integument, seen on its ventral face, with the hollow space which embraces the condyle, showing the longitudinal raphe and the transverse fissures of the ruminated albumen, into which the folds of the integument enter, as in *Tinospora.* *Fig. 17*, a longitudinal section of the same: *all nat. size.* *Fig. 18*, the same as *fig. 16*, *magnified.* *Fig. 19*, a longitudinal section of the same, showing the ruminated albumen and the position of the embryo. *Fig. 20*, the same, upon the dorsal face, with the thin plate of simple albumen removed, showing the relative position, size, and shape of the embryo. *Fig. 21*, the embryo with its divaricated cotyledons: *all equally magnified.*

PLATE 96.—DISCIPHANIA LOBATA.

A portion of a male flowering branch, with analytical details, all copied from Dr. Eichler's drawing in Martius's 'Flora Brasiliensis.'

*Fig. 1*, a flower expanded, *nat. size.* *Fig. 2*, a flower before expansion, showing its manner of æstivation, *magnified.* *Fig. 3*, the same expanded, seen from beneath. *Fig. 4*, the same, viewed from above. *Fig. 5*, the three outer sepals. *Fig. 6*, the three inner sepals: *all magnified to the same scale.* *Fig. 7*, the petals and stamens, seen from above, *more magnified.* *Fig. 8*, a transverse section of the same, to show the relative thickness of the petals. *Fig. 9*, the three outer petals. *Fig. 10*, the three inner petals. *Fig. 11*, the three free stamens, all seen in different positions, and *all magnified on the same scale.*

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PLATE 97.—ANAMIRTA LEMNISCATA.

A portion of a branch of the male flowering plant, and another of ANAMIRTA PANICULATA with its fructiferous raceme.

*Fig. 1*, a male flower on its pedicel, *nat. size*. *Fig. 2*, the same expanded, *magnified*. *Fig. 3*, the three outer bracteiform sepals. *Fig. 4*, the five inner sepals. *Fig. 5*, the fifteen or more almost sessile stamens agglomerated in a capitate form: *all magnified to the same scale*. *Fig. 6*, a stamen, before and after expansion, *more magnified*. *Fig. 7*, a female flower before expansion, *nat. size*. *Fig. 8*, the same expanded, *magnified*. *Fig. 9*, the three external bracteiform sepals. *Fig. 10*, the three intermediate sepals. *Fig. 11*, the three internal sepals. *Fig. 12*, the five ovaries, seated on the gynæcium and surrounded by a ring of ten extremely small sterile stamens: *all magnified to the same scale*. *Fig. 13*, a longitudinal section of an ovary, showing the form of its convex stigma and the mode of attachment of its ovule. *Fig. 14*, the annular ring of ten sterile stamens: *both more magnified*. *Fig. 15*, a drupe, *nat. size*: in the drawing of the female plant several drupes resulting from a single flower are shown borne upon the corresponding forks of the elongated carpophorum, on the summit of which the stipitated drupes are articulated. *Fig. 16*, a putamen deprived of its pericarp, viewed laterally. *Fig. 17*, the same, seen on its ventral face: *both nat. size*. *Fig. 18*, a side view of the putamen, showing one of the openings leading into the condyle, *magnified*. *Fig. 19*, the same, seen on the ventral face, where, in the hollow space, the two small circular apertures leading into the condyle are seen. *Fig. 20*, a longitudinal section of the same, showing the form and relative size of the condyle, and one of the apertures leading into the hollow chamber. *Fig. 21*, a transverse section of the same, showing the two channels leading into the two-chambered condyle and its internal groove into which the integument of the seed is insinuated. *Fig. 22*, a lateral view of the seed, covered by a thin integument. *Fig. 23*, the same seen on its ventral face, showing the hollow space fitting round the condyle, and the longitudinal line of raphe which penetrates the condylar groove. *Fig. 24*, a longitudinal section of the same, showing the hollow internal space and the position of the embryo imbedded in the albumen, the inner thick portion of which is ruminated. *Fig. 25*, a transverse section of the same, showing the portion of the integument with the raphe which insinuated itself into the groove of the condyle. *Fig. 26*, a dorsal view of the same, with the thin plate of simple albumen removed to show the size and position of the embryo. *Fig. 27*, the curved embryo, with its divaricated cotyledons: *all magnified to the same scale*.

PLATE 98.—PARABÆNA SAGITTATA.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, a branchlet of the male panicle. *Fig. 2*, a flower, on its pedicel, before expansion: *both nat. size*. *Fig. 3*, the three outer sepals, in different positions, *magnified*. *Fig. 4*, the three inner sepals. *Fig. 5*, the six petals. *Fig. 6*, the monadelphous stamen: *all magnified to the same scale*. *Fig. 7*, the same, showing the six anther-cells fixed round a common peltate connective and supported by the filaments united into a central column. *Fig. 8*, the same, seen from above: *both more magnified*. *Fig. 9*, one of the anther-cells before dehiscence. *Fig. 10*, the same after dehiscence: *both still more magnified*. *Fig. 11*,

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a female flower on its pedicel, before expansion, *nat. size*. *Fig. 12*, one of the six sepals, *magnified*. *Fig. 13*, one of the six petals. *Fig. 14*, the three ovaries seated on the gynæcium, which is surrounded at its base by the six small sterile stamens. *Fig. 15*, the six sterile stamens: *all magnified to the same scale*. *Fig. 16*, the three ovaries, *more magnified*. *Fig. 17*, one of the three drupes, the two others having fallen from the receptacle, *nat. size*. *Fig. 18*, the putamen deprived of its pericarp, seen on its dorsal face. *Fig. 19*, the same, seen on its ventral face: *both nat. size*. *Fig. 20*, the same, shown on its ventral face, showing the central hollow of the condyle, edged with teeth, with a peripheral series of teeth round the outer margin, and the longitudinal carinal suture down the middle, *magnified*. *Fig. 21*, the same, seen on the ventral face, showing the toothed periphery, the toothed carinal suture, and two intermediate lines of prominent teeth. *Fig. 22*, the same, viewed laterally. *Fig. 23*, a longitudinal section of the putamen, showing the external hollow surface of the condyle, with its internal surface convex within the cell, and continuously surrounded by the dorsal and ventral, toothed, prominent sutural line. *Fig. 24*, the seed extracted, showing on its ventral face a corresponding hollow and the longitudinal raphe by which it adheres to the inner surface of the condyle. *Fig. 25*, a dorsal view of the same, with the outer surface removed to show the enclosed embryo with divergent cotyledons, seated in the middle of finely ruminated albumen: this structure was only observed after the text in p. 57 was printed. *Fig. 26*, a longitudinal section of the same, showing the position of the embryo: *all magnified to the same scale*.

PLATE 99.—ASPIDOCARYA UVIFERA.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, the twelve sepals, in four series. *Fig. 2*, the six petals. *Fig. 3*, the monadelphous stamens: *all nat. size*. *Fig. 4*, the three external sepals. *Fig. 5*, the three sepals of the next series. *Fig. 6*, the three sepals of the following series. *Fig. 7*, the three inner sepals. *Fig. 8*, the six petals. *Fig. 9*, the six anthers, fixed on the margin of a peltiform connective, supported upon a central monadelphous column: *all equally magnified*. *Fig. 10*, an anther before dehiscence. *Fig. 11*, the same after dehiscence: *both more magnified*. *Fig. 12*, one of the three stipitated drupes. *Fig. 13*, the putamen deprived of its pericarp, shown on its dorsal face. *Fig. 14*, the same, seen edgeways. *Fig. 15*, the same, on its ventral face: *all nat. size*. *Fig. 16*, the putamen, showing the prominent keel on its dorsal face. *Fig. 17*, a longitudinal section of the same, showing the aperture through which the nourishing-vessels pass to form the short funicle attached to the raphe. *Fig. 18*, a transverse section of the putamen, indicating the keel on its dorsal face. *Fig. 19*, a lateral view of the seed, with the funicle on the ventral side in connexion with the raphe. *Fig. 20*, a view of the same on its ventral face, showing the longitudinal raphe and basal chalaza. *Fig. 21*, a lateral view of the same, deprived of its integument. *Fig. 22*, a longitudinal section of the same, showing the position of the embryo below the thin surface of the albumen on its dorsal face. *Fig. 23*, the same, seen on its dorsal face, with the thin stratum of the albumen removed, showing the relative size and position of the embryo, with its divergent cotyledons, *all equally magnified*.

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PLATE 100.—ODONTOCARYA ACUPARATA.

A portion of a branch of the female plant in fruit, and another of the male plant of  
ODONTOCARYA HEDERÆFOLIA in flower.

*Fig. 1*, a male flower on its pedicel, before expansion. *Fig. 2*, the three outer sepals. *Fig. 3*, the three intermediate sepals. *Fig. 4*, the three inner sepals. *Fig. 5*, the six sepals. *Fig. 6*, the stamens: *all nat. size*. *Fig. 7*, one of the three outer sepals, *magnified*. *Fig. 8*, one of the three intermediate sepals. *Fig. 9*, one of the three inner sepals. *Fig. 10*, one of the six petals. *Fig. 11*, the six monadelphous stamens: *all magnified to the same scale*. *Fig. 12*, an anther on a portion of the filament, *more magnified*. *Fig. 13*, one of the three stipitate drupes. *Fig. 14*, a putamen deprived of its pericarp, and covered with dense thick tomentum, seen on the dorsal face. *Fig. 15*, the same, viewed sideways. *Fig. 16*, the same, shown on its ventral face. *Fig. 17*, the osseous putamen deprived of its tomentous coating, shown on its dorsal face. *Fig. 18*, a view of the same, on its ventral face: *all nat. size*. *Fig. 19*, dorsal view of the osseous putamen, with a slightly tuberculated surface, with three teeth at each extremity, *magnified*. *Fig. 20*, the same, shown on the ventral side, with a hollow condyle. *Fig. 21*, a transverse section of the putamen. *Fig. 22*, the seed, covered by its thin integument, showing the hollow space on the ventral side and the longitudinal raphe belonging to it, where it covers the ruminated albumen, and where it is fitted to the condyle. *Fig. 23*, the seed deprived of its integument, shown on its dorsal face, the thin stratum of simple albumen having been removed to show the relative size and position of the enclosed embryo. *Fig. 24*, a longitudinal section of the same, showing the position of the embryo within the albumen, which is thick and ruminated on the ventral side, and extremely thin and simple on the dorsal face. *Fig. 25*, the embryo extracted, seen edgeways. *Fig. 26*, the same, seen in front, showing the divergence of the cotyledons: *all magnified to the same scale*.

PLATE 101.—RHIGIOCARYA RACEMIFERA.

A portion of a branch of the female plant in fruit.

*Fig. 1*, one of the three stipitate drupes, *nat. size*. *Fig. 2*, the putamen deprived of its pericarp, shown on its dorsal face. *Fig. 3*, the same, viewed edgeways. *Fig. 4*, the same, seen on its ventral face: *all nat. size*. *Fig. 5*, the putamen, densely echinated on its dorsal side with nail-headed erect spines. *Fig. 6*, the same, shown edgeways. *Fig. 7*, the same, seen on the ventral face, showing the long aperture leading into the very large hollow condyle. *Fig. 8*, a longitudinal section of the same, showing the seminal cell and the large hollow chamber of the condyle: *all magnified*. *Fig. 9*, shows the shape of the spines, the short terminal hairs having been omitted, *more magnified*. *Fig. 10*, the seed extracted from its cell, covered by its integument, showing, on the ventral side, the longitudinal raphe and its chalaza. *Fig. 11*, the same, viewed edgeways. *Fig. 12*, the same, deprived of its integument, seen on the dorsal side, with the thin stratum of albumen removed, exhibiting the enclosed embryo with its divaricated cotyledons: *all magnified to the same scale as fig. 5*.



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PLATE 102.—ANOMOSPERMUM NITIDUM.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, a flower expanded. *Fig. 2*, the three external sepals. *Fig. 3*, the three internal sepals. *Fig. 4*, the six sepals, enclosing the stamens aggregated together like a disk in the centre: *all nat. size.* *Fig. 5*, the expanded flower, seen from above, *magnified.* *Fig. 6*, the same, seen from below. *Fig. 7*, the three external sepals. *Fig. 8*, the three inner sepals. *Fig. 9*, the six fleshy petals, shown in different positions. *Fig. 10*, the six stamens, almost concealed within the involuted margins of the petals: *all equally magnified.* *Fig. 11*, three of the stamens, shown in different positions, *more magnified.* *Fig. 12*, the sterile ovary, *magnified.* *Fig. 13*, the three ovaries on the receptacle of a female flower, *magnified.* *Fig. 14*, one of the same viewed dorsally (the other two removed). *Fig. 15*, the same seen sideways, to show the form of the stigma, *more magnified.* *Fig. 16*, a longitudinal section of an ovary, to show the mode of attachment of the ovule, *still more magnified.* *Fig. 17*, a drupe, with its stipitated support, *nat. size.* *Fig. 18*, the same with half the fleshy pericarp removed, showing the fleshy mesocarp, which remains firmly adhering to the putamen. *Fig. 19*, the arilliform mesocarp composed of aggregated, yellowish, translucent, juicy globules. *Fig. 20*, the putamen with half of the mesocarpal covering removed. *Fig. 21*, the putamen deprived of its covering, viewed laterally. *Fig. 22*, a longitudinal section of the same, with the included seed, showing the laminiform condyle on the ventral face, to which the seed is attached on its margin by the raphigerous integument; the terete embryo occupies the centre of the copious albumen, which forms a solid film around it, while all the remainder is everywhere split into innumerable fissures, into which the very thin integument is insinuated. *Fig. 23*, a transverse section of the same, showing the depth of the main fissure occupied by the condyle, and the solid portion of the albumen which immediately surrounds the embryo. *Fig. 24*, a transverse section of the putamen, from which the seed has been extracted, showing the extent to which the condyle projects towards the centre of the cell. *Fig. 25*, a longitudinal section of the same, showing the length of the condyle. *Fig. 26*, the embryo extracted, which is quite terete and very slender; but the cotyledons are here separated, to show their form: *all nat. size.*

PLATE 103.—ANOMOSPERMUM LUCIDUM.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, a male flower expanded, *nat. size.* *Fig. 2*, the same, *magnified.* *Fig. 3*, the three external bracteiform sepals. *Fig. 4*, the three intermediate sepals. *Fig. 5*, the three inner sepals. *Fig. 6*, the six petals, enclosing the stamens: *all equally magnified.* *Fig. 7*, two of the same, *more magnified.* *Fig. 8*, one of the same fleshy petals expanded. *Fig. 9*, the six stamens, shown in different positions: *all more magnified, on the same scale.* *Fig. 10*, a stipitated fruit, *nat. size.* *Fig. 11*, the same with half of the fleshy pericarp removed, showing the enclosed putamen. *Fig. 12*, the osseous putamen, marked by retiform or scalariform fine grooves; as this was examined in a dried state, the mucilaginous mesocarp described in the former species, if it here once existed, is now not discernible. *Fig. 13*, the same, with half of the putamen removed to show the seed, in which is seen the deep groove occupied by the condyle. *Fig. 14*, a transverse section of the putamen, deprived of the seed, showing the intruding longitudinal condyle. *Fig. 15*, the seed with

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its very thin integument, showing the deep groove occupied by the condyle, which extends along the entire length of the ventral face. *Fig. 16*, a transverse section of the same, showing the central position of the embryo and the deeply ruminated albumen, the fissures of which are penetrated by the thin integument. *Fig. 17*, a longitudinal section of the same, showing the relative length and thickness of the enclosed embryo. *Fig. 18*, the embryo extracted, shown sideways and in front, and also with the cotyledons separated by force: *all nat. size.*

PLATE 104.—*TILLACORA RACEMOSA.*

A portion of a branch of the male plant in flower, and an analysis of the fruit of the female plant.

*Fig. 1*, a branchlet of the male raceme, with its three pedicellated flowers. *Fig. 2*, a single flower. *Fig. 3*, the three outer sepals. *Fig. 4*, the three intermediate sepals. *Fig. 5*, the three inner sepals. *Fig. 6*, the six stamens, with the six scale-like petals at their base: *all nat. size.* *Fig. 7*, the six petals, shown in different positions, three of which are seen attached externally by their claw to the base of the stamens, *much magnified.* *Fig. 8*, a branchlet of the raceme of the female flower in fruit, *nat. size.* *Fig. 9*, the same, *magnified*, showing on the summit of the pedicel the common receptacle, out of which spring seven carpophora, from which five of the stipitate drupes have fallen; all these are growths from a single flower, lengthening after the fall of the sepals, when they begin to carry up the several ovaries as here shown. *Fig. 10*, one of the stipitated drupes. *Fig. 11*, longitudinal section of the putamen, with its thin exsiccated pericarp, showing the incomplete dissepiment, which gives a bimar-supial shape to the cell and a hippocrepal form to the enclosed seed. *Fig. 12*, a transverse section of the same, showing the bimar-supial cell. *Fig. 13*, the same, from which the seed has not been removed. *Fig. 14*, the seed removed, covered with its thin integument, the folds of which penetrate the fissures of the ruminated albumen; it is attached at its sinus to the edge of the condylar septum. *Fig. 15*, a longitudinal section of the same, showing the position of the embryo within the ruminated albumen. *Fig. 16*, the embryo, seen edgeways. *Fig. 17*, the same, seen more upon its face, showing the strap-shaped incumbent cotyledons to be much broader and longer than the terete radicle: *all magnified to the same scale.*

PLATE 105.—*ABUTA HETEROPHYLLA.*

A portion of a branch of the male plant in flower, and an analysis of its fruit.

*Fig. 1*, a flower before expansion, *nat. size.* *Fig. 2*, the same, *magnified.* *Fig. 3*, the three outer bracteiform sepals. *Fig. 4*, the three intermediate sepals, smooth inside. *Fig. 5*, the three inner sepals with valvate aestivation. *Fig. 6*, the six stamens: *all equally magnified.* *Fig. 7*, three of the same stamens, shown in different positions, *more magnified.* *Fig. 8*, the same, anthers laterally attached to the filament, seen from above. *Fig. 9*, a female flower, *magnified.* *Fig. 10*, the same with two outer series of sepals removed, showing the three equal inner sepals closed in valvate aestivation (an error is made in the middle one, which is much too narrow). *Fig. 11*, the six sterile stamens that surround the three ovaries. *Fig. 12*, one of these, shown larger. *Fig. 13*, one of the three ovaries seated on the gynæcium: *all (except Fig. 12) magnified to the same scale.* *Fig. 14*, one of the substipitate drupes, covered with dense tomentum. *Fig. 15*, the putamen deprived of its exsiccous pericarp. *Fig. 16*, a longitudinal section of the same, showing its bimar-supial cell, divided by a condylar incomplete septum. *Fig. 17*, a longi-

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tudinal section of the same in the opposite direction, showing the same septum, to the upper edge of which the seed is attached. *Fig. 18*, the hippocrepiform seed, covered by a very thin membrane insinuated between the folds of the ruminated albumen, seen edgeways. *Fig. 19*, the same, seen on its face. *Fig. 20*, a longitudinal section of the same, showing the embryo in the middle of the albumen. *Fig. 21*, the terete hippocrepiform embryo: *all nat. size.*

PLATE 106.—*ABUTA (BATSCHIA) RACEMOSA.*

A portion of a branch of the male plant in flower, and an analysis of its male and female flowers.

*Fig. 1*, a male flower on its pedicel, before expansion, *nat. size.* *Fig. 2*, the three outer sepals. *Fig. 3*, the three intermediate sepals. *Fig. 4*, the three inner sepals, smooth inside, with valvate aestivation. *Fig. 5*, the six stamens, in two series, *all magnified to the same scale.* *Fig. 6*, the three outer stamens, with filaments setosely pilose on a longitudinal line within and on the margin. *Fig. 7*, the three inner, narrower stamens: *both more magnified.* *Fig. 8*, a female flower before expansion, on its pedicel, *nat. size.* *Fig. 9*, the three outer sepals. *Fig. 10*, the three intermediate sepals. *Fig. 11*, the three inner sepals, smooth inside, with valvate aestivation. *Fig. 12*, the three ovaries, surrounded by the sterile stamens, all seated on the gynæcium, the sepals having been removed. *Fig. 13*, the six sterile stamens. *Fig. 14*, the three ovaries separated: *all magnified on the same scale.*

PLATE 107.—*ANELASMA GARDNERIANUM.*

A portion of a branch of the male plant in flower, and another of the female plant of *ANELASMA STRUMOSUM* in flower and in fruit.

*Fig. 1*, a male flower before expansion, on its pedicel, *nat. size.* *Fig. 2*, the same, *magnified.* *Fig. 3*, the same expanded. *Fig. 4*, the three outer sepals. *Fig. 5*, the three inner sepals, with subimbricate aestivation. *Fig. 6*, the six stamens: *all equally magnified.* *Fig. 7*, two of the introrse stamens before dehiscence. *Fig. 8*, the same, showing their very peculiar form in dehiscence: *both more magnified.* *Fig. 9*, one of the three stipitate drupes, *nat. size.* *Fig. 10*, section of the pericarp from which the putamen has been removed. *Fig. 11*, the putamen, seen on its face. *Fig. 12*, the same, seen on its edge. *Fig. 13*, a longitudinal section of the same, showing the condylar septum that forms the bimar-supial cell. *Fig. 14*, a transverse section of the same. *Fig. 15*, the seed extracted, covered by the thin integument, plicated and insinuated into the fissures of the albumen. *Fig. 16*, a longitudinal section of the same, showing the embryo in the middle of the albumen ruminated into innumerable fissures. *Fig. 17*, the long slender hippocrepiform embryo: *all nat. size.*

PLATE 108.—*HYPSEPPA CUSPIDATA.*

A portion of a branch of the male plant in flower, with another of the same, to show the larger size of the leaves on the older branches.

*Fig. 1*, an axillary panicle, *nat. size.* *Fig. 2*, the three outer sepals. *Fig. 3*, the three intermediate sepals. *Fig. 4*, the four inner sepals, imbricated in aestivation. *Fig. 5*,

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the five petals. *Fig. 6*, the seven stamens, showing the constantly unsymmetrical number of the floral parts: *all slightly magnified, on the same scale.* *Fig. 7*, the inner sepals, shown in three different positions. *Fig. 8*, the petals embracing the stamens: *both more magnified.* *Fig. 9*, the introrse stamens, shown in three different positions, *more highly magnified.* *Fig. 10*, a drupe on its pedicel, seen sideways. *Fig. 11*, the same, on its ventral face. *Fig. 12*, the putamen deprived of its pericarp: *all nat. size.* *Fig. 13*, the same, showing the small aperture into one of the chambers of the condyle, *magnified.* *Fig. 14*, the same, shown on its dorsal face. *Fig. 15*, a longitudinal section of the same through the sutural line, showing the form of the condyle upon the line of the suture, with the internal aperture leading into the external chamber. *Fig. 16*, a transverse section of the same, showing the shape and size of the hippocrepiform cell and of the two hollow chambers of the condyle, with the respective openings into them. *Fig. 17*, the seed extracted, covered by its thin integument, a side view. *Fig. 18*, an end view of the same, showing a portion of the internal raphe. *Fig. 19*, a longitudinal section of the same, showing the position of the embryo in the middle of the simple albumen. *Fig. 20*, a transverse section of the same, showing the internal line of raphe parallel to the course of the embryo. *Fig. 21*, the terete embryo extracted. *Fig. 22*, the same, with the cotyledons separated, showing them to be *accumbent* upon the radicle: *all equally magnified.*

PLATE 109.—LIMACIA DISTINCTA.

A portion of a branch of the male plant in flower, and another of the female plant  
in fruit.

*Fig. 1*, a male flower on its pedicel, before expansion, *nat. size.* *Fig. 2*, the same, *magnified.* *Fig. 3*, the same expanded, seen from below, showing the alternate position of the three series of sepals and the constantly symmetrical number of the floral parts, as opposed to *Hypserpa*, where these are always unsymmetrical. *Fig. 4*, the three inner sepals, with valvate aestivation. *Fig. 5*, the six petals, with inflected margins, shown in different positions. *Fig. 6*, the six stamens: *all magnified to the same scale.* *Fig. 7*, a female flower, seen from below, *magnified.* *Fig. 8*, the three outer sepals. *Fig. 9*, the three intermediate sepals. *Fig. 10*, the three inner sepals, with valvate aestivation. *Fig. 11*, the six petals. *Fig. 12*, the six sterile stamens. *Fig. 13*, the three ovaries. *Fig. 14*, the same, seen in different positions, to show the form of the stigma: *all magnified to the same scale.* *Fig. 15*, one of the stipitated drupes on the receptacle, from which the other two have fallen, seen sideways. *Fig. 16*, the same, seen endways. *Fig. 17*, the putamen deprived of its pericarp: *all nat. size.* *Fig. 18*, the same, *magnified*, showing the prominent peripheral zone, and the central aperture into one of the large hollow chambers of the condyle. *Fig. 19*, the same, divided along the sutural line, showing the inside of the cell, the prominent half of the condyle, and the inner aperture into it. *Fig. 20*, a transverse section of the putamen, showing the two large hollow chambers of the condyle and the seed in its cell, enclosing the embryo in the centre of the albumen. *Fig. 21*, the seed extracted, seen endways, covered by its thin integument, and showing the internal line of raphe. *Fig. 22*, a section of the same, to show the position of the embryo in the simple albumen. *Fig. 23*, a longitudinal section of the same. *Fig. 24*, the embryo extracted, thinner when thus seen laterally. *Fig. 25*, the same, showing it to be much broader when viewed endways. *Fig. 26*, a lateral view of the same, with the cotyledons separated to show their *accumbent* position in regard to the shorter radicle: *all magnified to the same scale.*

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PLATE 110.—MENISPERMUM CANADENSE.

A portion of a branch of the male plant in flower, and another of the female plant, also in flower, together with an analysis of its fruit.

*Fig. 1*, a male flower on its bracteated pedicel, before and after expansion, *nat. size*. *Fig. 2*, the three outer sepals. *Fig. 3*, the three inner sepals. *Fig. 4*, the six petals, with inflected margins, in different positions, one being expanded to show their shape. *Fig. 5*, seven of the more numerous stamens, unequal in size, in different series: *all equally magnified*. *Fig. 6*, four of the anthers, showing how they are affixed upon their filaments, and their marginal dehiscence, *more magnified*. *Fig. 7*, a female flower, *nat. size*. *Fig. 8*, the three external sepals. *Fig. 9*, the three inner sepals. *Fig. 10*, the six petals. *Fig. 11*, the six sterile stamens fixed to the claws of the petals. *Fig. 12*, one of the three ovaries fixed upon a raised gynæcium, showing the relative position of the stamens and petals: *all equally magnified*. *Fig. 13*, one of the drupes, *magnified more than twice its nat. size*. *Fig. 14*, the putamen deprived of its pericarp, showing the peripheral and one of the lateral prominent crenated rings. *Fig. 15*, an end view of the same, showing the three prominent rings. *Fig. 16*, a longitudinal section of the same, through the sutural line, showing the form of the cell, the laminiform condyle, and the aperture leading from the exterior into the internal groove between the two plates of the condyle. *Fig. 17*, the seed extracted, showing the extension of the thin integument, intruded between the two plates of the condyle. *Fig. 18*, the same, shown edgewise and dorsally. *Fig. 19*, the same, deprived of its integument, showing the position of the embryo in simple albumen. *Fig. 20*, the terete hippocrepiform embryo, seen also with the cotyledons separated, to show their *incumbent* position in regard to the radicle: *all magnified to the same scale*.

PLATE 111.—PERICAMPYLUS INCANUS.

A portion of a branch of the male plant in flower, and another of the female plant in flower and in fruit.

*Fig. 1*, a male pedicellated flower, *nat. size*. *Fig. 2*, the same, with the sepals rotately expanded, *magnified*. *Fig. 3*, the three external bracteiform sepals. *Fig. 4*, the three intermediate sepals. *Fig. 5*, the three inner sepals. *Fig. 6*, the six petals. *Fig. 7*, the six free stamens: *all equally magnified*. *Fig. 8*, one of the petals, with its margins inflected round the stamen. *Fig. 9*, the petal expanded. *Fig. 10*, a stamen, seen sideways and in front, showing the transverse mode of dehiscence: *all more magnified*. *Fig. 11*, a petal and sterile stamen of the female flower. *Fig. 12*, the sterile stamen. *Fig. 13*, one of the three ovaries (two removed) upon the raised gynæcium, showing the relative points of insertion of the petals and stamens. *Fig. 14*, one of the ovaries, to show the form of the style and stigma: *all magnified to the same scale*. *Fig. 15*, a drupe, shown sideways and edgewise. *Fig. 16*, a putamen, seen in the same positions: *all nat. size*. *Fig. 17*, a putamen deprived of its pericarp, showing the three series of external spines around the concave, discoid, imperforated condyle. *Fig. 18*, the same, seen edgewise, showing the sutural line. *Fig. 19*, a longitudinal division of the same through the line of suture, showing the form of the cell round the flat inner face of the condyle. *Fig. 20*, a contrary section of the same, showing the form of the condyle and of the cell containing the seed. *Fig. 21*, a side view of the seed covered by its thin integument, which is expanded internally and insinuated between the two plates of the condyle. *Fig. 22*, an

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end view of the same. *Fig. 23*, a longitudinal section of the same deprived of its integument, showing the position of the embryo in the simple albumen. *Fig. 24*, a transverse section of the same. *Fig. 25*, the terete embryo extracted, showing its *incumbent* cotyledons: *all magnified to the same scale*.

PLATE 112.—PSELIMUM AMBIGUUM.

A portion of the male plant in flower.

*Fig. 1*, a male pedicellated flower, *nat. size*. *Fig. 2*, the same, with nearly erect sepals. *Fig. 3*, the same, with the sepals thrown back to show the relative position of the petals. *Fig. 4*, the three outer sepals. *Fig. 5*, the three inner sepals. *Fig. 6*, the six petals with inflected margins. *Fig. 7*, the six monadelphous stamens, the filaments being united for half their length into a central column: *all equally magnified*. *Fig. 8*, four of the anthers, showing the mode of their attachment to the filament and their mode of dehiscence, *more magnified*.

PLATE 113.—ILEOCARPUS SCHIMPERI.

A portion of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, a pedicellated male flower, *nat. size*. *Fig. 2*, the three outer sepals. *Fig. 3*, the three inner sepals. *Fig. 4*, the three petals. *Fig. 5*, the monadelphous stamens. *Fig. 6*, the same, seen from above: *all equally magnified*. *Fig. 7*, a pedicellated female flower, *nat. size*. *Fig. 8*, the same expanded, *magnified*. *Fig. 9*, the three outer bracteiiform sepals. *Fig. 10*, the three inner sepals. *Fig. 11*, the three petals. *Fig. 12*, the solitary ovary and pedicel: *all equally magnified*. *Fig. 13*, the same, *more magnified*, showing the form of the stigma. *Fig. 14*, a longitudinal section of the same, showing the mode of attachment of its ovule. *Fig. 15*, a drupe on its pedicel, *nat. size*. *Fig. 16*, the putamen of the same. *Fig. 17*, the putamen with its concave laminiiform condyle, *magnified*. *Fig. 18*, the same, seen edgewise. *Fig. 19*, a longitudinal section of the same through the sutural line, showing the cell of the seed around the discoid condyle. *Fig. 20*, the seed extracted, showing the inside expansion of its thin integument, insinuated between the two plates of the condyle. *Fig. 21*, a section of the same deprived of its integument, showing the terete embryo imbedded in simple albumen. *Fig. 22*, a cross section of the same. *Fig. 23*, the terete embryo extracted, with its short *incumbent* cotyledons displayed: *all equally magnified*.

PLATE 114.—HOMOCNEMIA MEYERIANA.

A portion of the female plant in flower.

*Fig. 1*, the umbellate flowers on a long supra-axillary peduncle, *magnified*. *Fig. 2*, one of the large bracts of the umbel. *Fig. 3*, one of the umbels, surmounted by its four involucreting bracteoles, which encircle four short umbellulated peduncles, each bearing on its summit four sessile bracteolated flowers. *Fig. 4*, one of the four umbellules supporting four sessile flowers. *Fig. 5*, one of the sessile flowers with its basal bracteole: *all magnified on the same scale*. *Fig. 6*, the same flower with its bracteole. *Fig. 7*, the floral bracteole. *Fig. 8*, the flower, seen sideways. *Fig. 9*, the same expanded, seen from above. *Fig. 10*, a trimerous flower (of rare occurrence). *Fig. 11*, the three inner

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sepals, seen in three different positions, showing them to be smooth inside. *Fig. 12*, one of the petals similarly placed. *Fig. 13*, the single ovule: *all equally more magnified*. *Fig. 14*, the ovary, showing the form of the style and stigma, *still more magnified*. *Fig. 15*, the same, shown edgewise. *Fig. 16*, a longitudinal section of the same, to show the attachment of its ovule: *both equally magnified*.

PLATE 115.—CISSAMPELOS MICROCARPA.

A portion of a male plant in flower, and another of the female plant in flower and in fruit.

*Fig. 1*, a male flower in bud. *Fig. 2*, the same, after expansion: *both nat. size*. *Fig. 3*, the flower expanded, seen from above. *Fig. 4*, the four sepals. *Fig. 5*, the cup-shaped petal. *Fig. 6*, the monadelphous stamen: *all equally magnified*. *Fig. 7*, the petal. *Fig. 8*, the stamens with six anther cells on the edge of a peltated connective supported on a central column. *Fig. 9*, the same, showing the transverse dehiscence of the cells: *all more magnified*. *Fig. 10*, a bract concealing three female pedicellated flowers, *magnified four times*. *Fig. 11*, one of the three pedicellated flowers. *Fig. 12*, its single sepal. *Fig. 13*, its single petal, fixed inside upon its claw. *Fig. 14*, the single ovary: *all equally magnified*. *Fig. 15*, a drupe. *Fig. 16*, its putamen: *both nat. size*. *Fig. 17*, the putamen, showing on its face three radiating and concentric rows of irregular tubercles, surrounding the central, concave, discoidal, imperforated condyle. *Fig. 18*, the same, seen on its edge, showing the peripheral line of suture. *Fig. 19*, half of the putamen, divided along the sutural line, showing internally the hippocrepiform cell from which the seed is extracted, with the groove within the centre of the condylar space for the conveyance of the nutritive vessels from the base to the bottom of the sinus at the point of the attachment of the seed as there shown. *Fig. 20*, the hippocrepiform seed extracted, crenately moulded to the shape of the cell and covered by its thin integument, in the sinus of which is shown the point of attachment of the seed to the condyle, and in communication, by means of the nourishing vessels, with the hilum at the basal margin on the outer extremity of the groove. *Fig. 21*, a transverse section of the same, showing the embryo imbedded in the albumen, and the cicatrix in the sinus which marks the point of attachment of the seed to the condyle. *Fig. 22*, a longitudinal section of the same, showing the form and relative size of the embryo imbedded in simple albumen. *Fig. 23*, the embryo extracted, viewed endways. *Fig. 24*, the hippocrepiform terete embryo, with *incumbent cotyledons*: *all magnified on the same scale*.

PLATE 116.—ANTIZOMA HARVEYANA.

A portion of a male plant in flower, another of the male plant of *ANTIZOMA BURCHELLIANA* in flower, and another of the female plant of *ANTIZOMA ANGUSTIFOLIA* in flower.

*Fig. 1*, a single axil of *A. Harveyana*, showing its peculiar infrapetiolar spine, *magnified*. *Fig. 2*, a single pedicellated flower, out of the small axillary capitated inflorescence of the same, with its basal bract, *much magnified*. *Fig. 3*, the same, viewed from above. *Fig. 4*, one of the four unguiculated sepals, seen from below and above. *Fig. 5*, the single cup-shaped petal. *Fig. 6*, the same, including the stamen. *Fig. 7*, the same, with half

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the petal cut away to show the position of the central column. *Fig. 8*, the four anthers united round the summit of the column, seen from above: *all equally magnified*. *Fig. 9*, a male flower of *A. burchelliana* expanded, seen from above, *greatly magnified*. *Fig. 10*, one of the four sepals. *Fig. 11*, the petal. *Fig. 12*, the same, with its included stamen. *Fig. 13*, the ten-lobed anther, seen from above: *all equally magnified*. *Fig. 14*, an axil of *A. angustifolia*, showing the half of a leaf with revolute margins, the infrapetiolar spine, and the twin pedicellated female flowers, *magnified*. *Fig. 15*, one of the same pedicellated flowers, with its basal bract, *more magnified*. *Fig. 16*, the two opposite sepals. *Fig. 17*, the two opposite petals, seated at the base of the sepals. *Fig. 18*, the ovary seated in the centre. *Fig. 19* shows the relative positions of the sepals, petals, and ovary: *all equally magnified*.

PLATE 117.—DISSOPETALUM MAURITIANUM.

A portion of a branch of the male plant in flower, and another of the female plant in flower.

*Fig. 1*, a male flower expanded, seen from above, *greatly magnified*. *Fig. 2*, one of the four sepals. *Fig. 3*, the single cup-shaped petal, guttately marked, as seen from above. *Fig. 4*, the same, viewed laterally. *Fig. 5*, the stamen: *all equally magnified*. *Fig. 6*, one of the imbricated bracts of the female spike, concealing nine pedicellated flowers: *nat. size*. *Fig. 7*, two of the pedicellated female flowers, in one of which one of the petals is thrown back. *Fig. 8*, shows the relative positions of the two petals in regard to the single sepal. *Fig. 9*, the ovary. *Fig. 10*, the single sepal. *Fig. 11*, the two lateral petals: *all magnified on the same scale*.

PLATE 118.—CLYPEA FORSTERI.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, one of the umbellules, *nat. size*. *Fig. 2*, the same, showing the solid disk on the summit of the bracteated peduncle, supporting numerous obsolete pedicellated flowers, *magnified*. *Fig. 3*, a flower shown laterally, on its extremely short bracteolated pedicel, *highly magnified*. *Fig. 4*, the same, with the sepals thrown back, showing the petals and stamen. *Fig. 5*, the basal bracteole: *both equally magnified*. *Fig. 6*, one of the articulated hairs of the bracteole and sepals, *very highly magnified*. *Fig. 7*, the four outer sepals, puberulous outside. *Fig. 8*, the four inner sepals, glabrous on both sides. *Fig. 9*, the four petals. *Fig. 10*, the stamen, with eight anther-cells. *Fig. 11*, the same, with the anthers bursting horizontally: *all magnified to the same scale*. *Fig. 12*, one of the umbellules of the female inflorescence, *nat. size*. *Fig. 13*, a section of the same, showing many sessile flowers on a thick fleshy disk, *magnified*. *Fig. 14*, one of the crowded sessile flowers, *highly magnified*. *Fig. 15*, the same expanded, showing the sepals, petals, and ovary. *Fig. 16*, the four sepals. *Fig. 17*, the two petals. *Fig. 18*, the ovary, crowned by its three stigmata: *all magnified to the same scale*. *Fig. 19*, a drupe. *Fig. 20*, its putamen. *Fig. 21*, the same, seen edgeways: *all nat. size*. *Fig. 22*, the putamen, seen on its face, with a somewhat central, flat, concave, imperforated condyle. *Fig. 23*, the same, seen on its edge, showing the peripheral line of suture. *Fig. 24*, half of the same, divided along the sutural line, showing its hipocrepical cell, and the condyle with its



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central groove which conveys the nourishing vessels from the base to the point of attachment of the seed to the condyle. *Fig. 25*, the seed extracted, showing the extension of the integument at the sinus where it penetrates between the two plates of the condyle with its attached cord of vessels: *all equally magnified*.

PLATE 119.—STEPHANIA GLABRA.

A portion of a branch of the male plant in flower, and another of the female plant in flower, with an analysis of its fruit.

*Fig. 1*, one of the male umbellules, bracteated at base, *nat. size*. *Fig. 2*, one of the pedicellated flowers, *nat. size*. *Fig. 3*, the same, *magnified*. *Fig. 4*, the same, with the sepals thrown back horizontally, showing the petals and stamen. *Fig. 5*, the three outer sepals. *Fig. 6*, the three inner sepals. *Fig. 7*, the three petals, marked by two collateral glands. *Fig. 8*, the stamen, with a six-celled anther. *Fig. 9*, a section of the same, to show the attachment of the cells round a peltate connective: *all magnified to the same scale*. *Fig. 10*, one of the seven umbellules of the female inflorescence, forming a racemule of five petiolated flowers, *nat. size*. *Fig. 11*, the same, *magnified*. *Fig. 12*, a flower, *magnified*. *Fig. 13*, one of the three sepals (one or two sometimes abortive). *Fig. 14*, the three petals. *Fig. 15*, the ovary, with its lacinated stigma: *all equally magnified*. *Fig. 16*, a drupe. *Fig. 17*, its putamen: *both nat. size*. *Fig. 18*, the putamen, having two rows of tubercles on the margin of each face, around the flat concave condyle, always perforated in the centre. *Fig. 19*, the same, viewed on its edge, showing the peripheral line of suture. *Fig. 20*, a cross section of the same, showing the perforated, concave, discoid condyle, and the cell enclosing the hippocrepiform seed. *Fig. 21*, inside view of half the putamen, divided by the sutural line, showing the hippocrepiform cell, the perforated condyle, and the groove leading from the basal hilum. *Fig. 22*, the seed extracted, with its integument expanded in the sinus, where it penetrates between the two plates of the condyle. *Fig. 23*, a longitudinal section of the same deprived of its integument, showing the embryo imbedded in simple albumen. *Fig. 24*, the hippocrepiform terete embryo, with *incumbent* cotyledons: *all magnified to the same scale*.

PLATE 120.—CLAMBUS ARANEOSUS.

A portion of a branch of the male plant in flower.

*Fig. 1*, an ultimate branchlet of the inflorescence, *nat. size*. *Fig. 2*, the same, *magnified* to show the imbricated bracteoles from which most of the flowers have fallen. *Fig. 3*, a flower before and after expansion, *equally magnified*. *Fig. 4*, a flower before expansion, on its pedicel, *much more magnified*. *Fig. 5*, the same expanded, showing the small erect petals round the foot of the staminal column. *Fig. 6*, the same, with the petals thrown back to show they are opposite to the sepals (not alternate with them as in *Euphorbiaceæ*: see remarks in the list of addenda, p. 393). *Fig. 7*, the three outer sepals. *Fig. 8*, the three inner sepals. *Fig. 9*, the stamen surrounded by the small petals. *Fig. 10*, the six petals: *all magnified to the same scale*. *Fig. 11*, the stamen, showing the transverse dehiscence of the anther-cells. *Fig. 12*, the six anther-cells fixed on the margin of a peltate connective (as in *Cissampelos*), seen from above: *both more magnified*.

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## PLATE 121.—CYCLEA BURMANNI.

A portion of a branch of the male plant in flower, and another of the female plant in flower and in fruit.

*Fig. 1*, a lateral branchlet of the male inflorescence, showing the arrangement of the flowers, *magnified*. *Fig. 2*, a single pedicellated flower, *nat. size*. *Fig. 3*, the same, *magnified*, showing its tubular calyx. *Fig. 4*, the calyx cut in two, to show the position of the corolla and stamen. *Fig. 5*, the cup-shaped corolla, showing the four inflected segments of its border. *Fig. 6*, the same, cut in half, to show more distinctly the inflection of the segments. *Fig. 7*, the monadelphous stamen, with four anther-cells on a peltate connective: *all magnified to the same scale*. *Fig. 8*, a pedicellated female flower, *nat. size*. *Fig. 9*, the same, *magnified*. *Fig. 10*, the single sepal, pilose outside. *Fig. 11*, the single petal, fixed to the claw of the sepal. *Fig. 12*, the ovary: *all equally magnified*. *Fig. 13*, a drupe. *Fig. 14*, its putamen: *both nat. size*. *Fig. 15*, the drupe, *magnified*. *Fig. 16*, the putamen, with two rows of small tubercles on each face, surrounding the convex condyle. *Fig. 17*, the same, seen on its edge, to show its globosely ovate shape. *Fig. 18*, a longitudinal section of the same, along the peripheral line of suture, showing internally the hippocrepiform cell, and the groove leading from the hilar base into the two chambers of the large hollow condyle. *Fig. 19*, a cross section, showing the seed in its cell and the two hollow chambers of the condyle. *Fig. 20*, the hippocrepiform seed extracted, covered by its membranaceous integument, showing in its sinus the cord of vessels and the extended membrane by which it is attached to the condyle. *Fig. 21*, a section of the same deprived of its integument, showing the embryo enclosed in simple albumen. *Fig. 22*, the hippocrepiform terete embryo, with *incumbent* cotyledons: *all magnified to the same scale*.

## PLATE 122.—PERAPHORA ROBUSTA.

The upper figure shows a portion of a branch of the male plant in flower, and the lower one of the female plant in flower, with an analysis of its fruit.

*Fig. 1*, a portion of the male inflorescence, *magnified*. *Fig. 2*, a male flower on its pedicel, *nat. size*. *Fig. 3*, the same, *magnified*. *Fig. 4*, the globular calyx cut in half, to show the enclosed stamen. *Fig. 5*, the stamen. *Fig. 6*, the same, seen from above: *all equally magnified*. *Fig. 7*, a portion of the female inflorescence, *magnified*. *Fig. 8*, a pedicellated female flower, *nat. size*. *Fig. 9*, the same, *magnified*. *Fig. 10*, the two opposite sepals. *Fig. 11*, the ovary: *all equally magnified*. *Fig. 12*, the stigma, *more magnified*. *Fig. 13*, a drupe. *Fig. 14*, its putamen: *both nat. size*. *Fig. 15*, the putamen, showing three concentric series of spines, round an imperforated concave condyle, striated down the middle. *Fig. 16*, the same, seen edgewise: *both magnified*.

## PLATE 123.—PERICHASMA LÆTIFICATA.

A portion of a branch of the male plant in flower.

*Fig. 1*, a flower on its pedicel, *nat. size*. *Fig. 2*, the same, *magnified*. *Fig. 3*, the same,

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more expanded. *Fig. 4*, the three outer sepals. *Fig. 5*, the three inner sepals. *Fig. 6*, the three petals. *Fig. 7*, the single stamen, bearing a solitary anther: *all magnified to the same scale.* *Fig. 8*, the stamen before the dehiscence of the anther. *Fig. 9*, the same, showing the opercular mode of its dehiscence: *both more magnified.*

PLATE 124.—COCCULUS GLABER.

A portion of the male plant in flower, and another of the female plant in flower and in fruit.

*Fig. 1*, one of the male sessile flowers of the capitate head, *nat. size.* *Fig. 2*, the flower expanded, seen from beneath. *Fig. 3*, the same, seen from above. *Fig. 4*, the three outer sepals. *Fig. 5*, the three intermediate sepals. *Fig. 6*, the three inner sepals. *Fig. 7*, the six petals, with their basal lobes inflected. *Fig. 8*, the six stamens: *all equally magnified.* *Fig. 9*, some of the stamens fixed to the claws of the petals, showing the form and attachment of the 2-lobed anther-cells, and their mode of dehiscence, *more magnified.* *Fig. 10*, a supra-axillary female inflorescence, the solitary peduncle bearing a head of few sessile flowers. *Fig. 11*, a single flower: *both nat. size.* *Fig. 12*, the flower expanded. *Fig. 13*, the three outer sepals. *Fig. 14*, the three intermediate sepals. *Fig. 15*, the three inner sepals. *Fig. 16*, the six petals. *Fig. 17*, the six sterile stamens. *Fig. 18*, the three ovaries: *all magnified on the same scale.* *Fig. 19*, one of the petals embracing a stamen fixed on its claw. *Fig. 20*, a sterile stamen separated. *Fig. 21*, the three ovaries, showing the form of the stigma: *all more magnified.* *Fig. 22*, the three drupes from one flower upon the peduncle. *Fig. 23*, one of the drupes. *Fig. 24*, its putamen: *all nat. size.* *Fig. 25*, the putamen, irregularly tuberculated on both sides, with an excentric condyle, and a lunated aperture near the centre leading into the cavity of the condyle. *Fig. 26*, the same, seen on its edge, showing the peripheral line of suture. *Fig. 27*, a cross section of the same, showing the seed in its cell, and the two hollow chambers of the condyle with the external apertures leading into them. *Fig. 28*, an internal view of the putamen divided in two along the sutural line, showing the hippocrepiform cell of the seed around the condyle (here convex), together with the groove terminating in its depressed centre. *Fig. 29*, the seed extracted, covered by its membranaceous integument, which is expanded at its sinus, where it is insinuated between the subglobular plates of the condyle. *Fig. 30*, a longitudinal section of the same, deprived of its integument, showing the embryo imbedded in simple albumen. *Fig. 31*, a cross section of the same. *Fig. 32*, the embryo, seen edgeways. *Fig. 33*, the same, seen on its side, showing its broad foliaceous *incumbent* cotyledons: *all magnified to the same scale.*

PLATE 125.—NEPHROICA HEXAGYNA.

A portion of a branch of the male plant in flower, and another of the female plant in flower, with an analysis of its fruit.

*Fig. 1*, a male flower expanded, seen from above, *magnified.* *Fig. 2*, the three outer sepals. *Fig. 3*, the three intermediate sepals. *Fig. 4*, the three inner sepals. *Fig. 5*, the six petals of this constant form. *Fig. 6*, the six stamens fixed to the claw of the petals: *all magnified to the same scale.* *Fig. 7*, a stamen, seen in different positions, before and after dehiscence, *more magnified.* *Fig. 8*, a female flower, *nat. size.* *Fig. 9*, the three outer sepals. *Fig. 10*, the three intermediate sepals. *Fig. 11*, the three inner sepals. *Fig. 12*, the six petals. *Fig. 13*, the six sterile stamens. *Fig. 14*, the six ovaries.

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*Fig. 15*, one of the ovaries, shown on the raised gynæcium: *all magnified to the same scale.* *Fig. 16*, a drupe. *Fig. 17*, its putamen: *both nat. size.* *Fig. 18*, the putamen tuberculated on each face, and crenated around the excentric hollow condyle, into which a lunulate aperture opens. *Fig. 19*, the same, seen on its edge, showing the peripheral line of suture. *Fig. 20*, a cross section of the same, showing the seed in its cell and the two chambers of the condyle, with the apertures leading into them. *Fig. 21*, an inside view of half the putamen, divided along the line of suture, showing the hippocrepiform cell of the seed, the central condyle, with the groove leading from the hilar base. *Fig. 22*, the hippocrepiform seed covered by its membranaceous integument, which is expanded in the sinus, where it is insinuated between the two halves of the condyle. *Fig. 23*, a longitudinal section of the same, with the embryo imbedded in simple albumen. *Fig. 24*, the embryo, seen on its edge. *Fig. 25*, the same, on its inner face, to show the much greater breadth of its *incumbent* cotyledons: *all magnified to the same scale.*

PLATE 126.—HOLOPEIRA VILLOSA.

A portion of a branch of the male plant in flower, and another of the female plant in flower, with an analysis of its fruit.

*Fig. 1*, an external bract, *magnified.* *Fig. 2*, the three outer sepals, villous outside. *Fig. 3*, the three inner sepals, also villous outside. *Fig. 4*, the six petals, with two rounded erect lobes in the summit, and two inflected lobes in the middle of the sides, pilose outside at the base; one of the six stamens is shown inserted on the claw of a petal: *all magnified to the same scale.* *Fig. 5*, four of the six stamens, before and after dehiscence, *a little more magnified.* *Fig. 6*, a female flower on its pedicel. *Fig. 7*, the same, expanded: *both nat. size.* *Fig. 8*, the three outer sepals. *Fig. 9*, the three inner sepals. *Fig. 10*, the six petals, showing the insertion of the sterile stamens. *Fig. 11*, the six sterile stamens. *Fig. 12*, the three ovaries. *Fig. 13*, one of the ovaries (two being removed) seated on the raised gynæcium: *all magnified to the same scale.* *Fig. 14*, the stigma, *more magnified.* *Fig. 15*, a drupe. *Fig. 16*, its putamen: *both nat. size.* *Fig. 17*, the putamen, marked by numerous, fine, radiating raised ridges, and an inner crenated rim surrounding a sunken flat condyle, perforated through the middle of each face, and through the centre, by three parallel apertures. *Fig. 18*, the same, seen on its edge, showing its peculiar form and the peripheral line of suture. *Fig. 19*, an inside view of half the putamen, divided by the line of suture, showing the cell of the seed around the perforated condyle. *Fig. 20*, a cross section of the putamen, showing the seed in its cell, the two hollow chambers of the condyle, and the three parallel apertures right through the centre of the putamen. *Fig. 21*, the hippocrepiform seed covered by its membranaceous integument, which is expanded in the sinus, where it is insinuated between the two halves of the condyle. *Fig. 22*, the embryo extracted from its sparse simple albumen. *Fig. 23*, the same, viewed on one side, showing its much broader *incumbent* cotyledons: *all magnified to the same scale.*

PLATE 127.—DIPLOCLISIA INCLYTA.

Portions of two branches of the male plant in flower, others of the female plant in flower and in fruit, together with an analysis of the fruit of *DIPLOCLISIA MACROCARPA.*

*Fig. 1*, a pedicellated male flower, *nat. size*: this is the largest I have ever met with; in most of the specimens the flower-buds are smaller. *Fig. 2*, the three outer sepals.

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*Fig. 3*, the three inner sepals. *Fig. 4*, the six petals, which embrace the stamens. *Fig. 5*, the six stamens: *all equally magnified*. *Fig. 6*, a stamen, shown in different positions, before and after expansion, *more magnified*. *Fig. 7*, a pedicellated female flower, *nat. size*. *Fig. 8*, the three outer sepals. *Fig. 9*, the three inner sepals. *Fig. 10*, the six petals, which embrace the sterile stamens. *Fig. 11*, the six sterile stamens. *Fig. 12*, one of the three ovaries (two removed), seated on the raised gynæcium: *all magnified to the same scale*. *Fig. 13*, an ovary, showing the form of the stigma, *more magnified*. *Fig. 14*, a drupe. *Fig. 15*, its putamen. *Fig. 16*, the same, seen edgewise. *Fig. 17*, the seed extracted. *Fig. 18*, the embryo, seen edgewise. *Fig. 19*, the same, shown on the broad face of the cotyledons: *all nat. size*. *Fig. 20*, a drupe of *Diplochisia macrocarpa*, always much larger. *Fig. 21*, its putamen, with a deep groove along the middle, and radiately impressed on both its hippocrepiform faces. *Fig. 22*, the same, seen on its edge, showing the peripheral line of suture. *Fig. 23*, an inside view of half the same, divided along the sutural line, showing the hollow hippocrepical or bimarsepical cell of the seed formed by a narrow septum in the middle, which corresponds with the external deep grooves. *Fig. 24*, a transverse section of the same, showing the two incomplete cells formed by the septum. *Fig. 25*, the hippocrepiform seed extracted, covered by its membranaceous integument, which is expanded in its sinus, where it is attached to the summit of the septum. *Fig. 26*, a side view of the same, deprived of its integument, showing the simple albumen impressed by the irregularities of the inner surface of the cell. *Fig. 27*, the hippocrepiform embryo extracted, shown on the broader face. *Fig. 28*, the same, showing the edge of its broad foliaceous *incumbent* cotyledons: *all nat. size*.

PLATE 128.—TRISTICHOCALYX PUBESCENS.

A portion of a branch of the male plant in flower, and another of the male plant of TRISTICHOCALYX DIFFUSUS in flower.

*Fig. 1*, a pedicellated flower of the latter. *Fig. 2*, the same expanded: *both nat. size*. *Fig. 3*, the same, seen from below: *magnified*. *Fig. 4*, the same, seen from above. *Fig. 5*, the three outer sepals. *Fig. 6*, the three intermediate sepals. *Fig. 7*, the three inner sepals. *Fig. 8*, the six petals, in different positions. *Fig. 9*, the six stamens, before and after dehiscence: *all equally magnified*.

PLATE 129.—LEGNEPHORA MOORII.

A portion of a branch of the male plant in flower, and another of the female plant in flower and in fruit.

*Fig. 1*, a pedicellated male flower. *Fig. 2*, the same, expanded: *both nat. size*. *Fig. 3*, the same, magnified. *Fig. 4*, the bract of the pedicel. *Fig. 5*, the three outer sepals. *Fig. 6*, the three inner sepals. *Fig. 7*, the six petals. *Fig. 8*, the six stamens: *all magnified to the same scale*. *Fig. 9*, a petal, in different positions, showing the gland on its margins. *Fig. 10*, a stamen, in different positions, before and after dehiscence: *all more magnified*. *Fig. 11*, a female flower on its bracteolated pedicel, *nat. size*. *Fig. 12*, the bracteole, *magnified*. *Fig. 13*, the three outer sepals. *Fig. 14*, the three inner sepals. *Fig. 15*, the six sterile stamens. *Fig. 16*, the three ovaries: *all magnified to the same scale*. *Fig. 17*, a sterile stamen. *Fig. 18*, an ovary, showing the form of the stigma: *both more magnified*. *Fig. 19*, a drupe, seated on the receptacle, from which the two others have fallen. *Fig. 20*, its putamen. *Fig. 21*, the same, seen

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edgeways: *all nat. size.* *Fig. 22*, the putamen, seen on its face, showing the three series of imbricating, laciniated, flat, pergameneous scales which surround the flat, concave, scutiform condyle. *Fig. 23*, the same, shown endways: *both magnified.* *Fig. 24*, one of the scales, seen in front and edgeways, *more magnified.* *Fig. 25*, a cross section of the putamen, showing the seed and the hollow between the two plates of the condyle along the sutural line of division. *Fig. 26*, inner view of half the putamen, showing the hippocrepiform cell of the seed and the groove from the basal hilum to the point of the attachment of the seed, at its sinus between the plates of the condyle. *Fig. 27*, the seed extracted. *Fig. 28*, a cross section of the same, showing the embryo imbedded in albumen: *all equally magnified.*

#### PLATE 130.—SARCOPETALUM HARVEYANUM.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 2*, a peduncular branchlet of the inflorescence, supporting two flowers, *nat. size.* *Fig. 3*, the same, *magnified.* *Fig. 4*, the peduncle, with the two short pedicels from which the flowers have been removed. *Fig. 5*, one of the flowers, seen from above: *all equally magnified.* *Fig. 6*, four sepals. *Fig. 7*, four petals, both variable in number and alike in the two sexes: *more magnified.* *Fig. 8*, the six sterile stamens of the female flower. *Fig. 9*, the ovaries, three to six in number: *all equally magnified.* *Fig. 10*, a sterile stamen. *Fig. 11*, an ovary, seen sideways and in front, to show the form of the stigma: *both more magnified.* *Fig. 12*, four drupes on one receptacle. *Fig. 13*, one of the same upon the receptacle. *Fig. 14*, its putamen. *Fig. 15*, the same, seen edgeways: *all nat. size.* *Fig. 16*, a drupe, *magnified.* *Fig. 17*, its putamen, showing the hippocrepiform, tuberculous, broad margin surrounding the lunated, excentric, scutiform condyle, with a small aperture near the margin. *Fig. 18*, a cross section of the same, showing the cell of the seed and the division made by the sutural line, which separates the condyle into two plates. *Fig. 19*, inside view of half the putamen so separated, showing the lunated cell of the seed surrounding the condylar plate perforated near the margin. *Fig. 20*, the seed covered by its membranaceous integument, which is expanded in its sinus, where it is insinuated between the plates of the condyle. *Fig. 21*, the same, deprived of its integument: *all magnified on the same scale.*

#### PLATE 131.—HYPERBÆNA DOMINGENSIS.

A portion of a branch of the male plant in flower, and another of the female plant in flower and in fruit.

*Fig. 1*, a branchlet of the raceme, *nat. size.* *Fig. 2*, the same, *somewhat magnified.* *Fig. 3*, a bracteole. *Fig. 4*, the three outer sepals. *Fig. 5*, the three inner sepals. *Fig. 6*, the six petals. *Fig. 7*, the six stamens: *all equally magnified.* *Fig. 8*, a stamen before and after dehiscence, *more magnified.* *Fig. 9*, the three outer sepals of the female flower. *Fig. 10*, the three inner sepals. *Fig. 11*, the six petals. *Fig. 12*, the six sterile stamens. *Fig. 13*, the three ovaries. *Fig. 14*, one of the same on the receptacle (the others removed): *all magnified to the same scale.* *Fig. 15*, a drupe on its pedicel, *nat. size.* *Fig. 16*, its smooth coriaceous putamen, with a short groove on each face. *Fig. 17*, a longitudinal section of the same, showing its bimarsupial cell, formed by an incomplete condylar septum, corresponding with the external grooves. *Fig. 18*, a cross

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section of the putamen close to the septum, to the top of which the seed is affixed. *Fig. 19*, a transverse section of the same, showing the two incomplete cells. *Fig. 20*, the hippocrepiform seed, covered by its membranaceous integument affixed to the margin of the septum. *Fig. 21*, the same, viewed in a contrary direction. *Fig. 22*, the same, deprived of its integument, showing the exalbuminous embryo, with large, fleshy, *accumbent* cotyledons and a small subterete radicle. *Fig. 23*, the same, with the cotyledons separated: *all nat. size.*

PLATE 132.—CHONDRODENDRON OBSCURUM.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, a pedicellated male flower, *nat. size.* *Fig. 2*, the same, *magnified.* *Fig. 3*, the same, with all the fifteen imbricated sepals removed, leaving the petals. *Fig. 4*, the same, with the petals removed, leaving only the stamens on the summit of the andrœcium. *Fig. 5*, the three outer sepals. *Fig. 6*, those of the second series. *Fig. 7*, those of the third series. *Fig. 8*, those of the fourth series. *Fig. 9*, those of the fifth or inner series. *Fig. 10*, the six petals. *Fig. 11*, the six stamens: *all magnified to the same scale.* *Fig. 12*, a stamen, seen in opposite directions, before and after dehiscence, showing the peculiar excurrent connective, *more magnified.* *Fig. 13*, one of the six stipitated drupes. *Fig. 14*, its smooth coriaceous putamen, grooved towards its extremity on both faces. *Fig. 15*, the same, seen edgeways, indicating the sutural peripheral line of suture. *Fig. 16*, a transverse section of the same, showing its two incomplete cells formed by a semiseptum corresponding with the external grooves. *Fig. 17*, a longitudinal section of the same close to the septum. *Fig. 18*, a longitudinal section of the same across the condylar septum, on the top of which the seed is attached by its integument. *Fig. 19*, the hippocrepiform seed extracted. *Fig. 20*, the exalbuminous embryo deprived of its integument, viewed on its edge. *Fig. 21*, the same, seen sideways. *Fig. 22*, the same, with its large, fleshy, *accumbent* cotyledons spread open to show the small radicle: *all nat. size.*

PLATE 133.—SYCHNOSEPALUM SAGOTIANUM.

A portion of a branch of the male plant in flower.

*Fig. 1*, a male flower, *much magnified.* *Fig. 2*, the three sepals of the outer series. *Fig. 3*, those of the second series. *Fig. 4*, those of the third series. *Fig. 5*, those of the fourth series. *Fig. 6*, those of the fifth series. *Fig. 7*, the six petals. *Fig. 8*, the three free and the three monadelphous stamens on the summit of the andrœcium, from which the numerous sepals, and the petals have been removed: *all magnified to the same scale.* *Fig. 9*, a stamen seen in different positions, before and after dehiscence, *more magnified.*

PLATE 134.—HEMATOCARPUS COMPTUS.

A portion of a branch of the male plant in flower, and another of *HEMATOCARPUS THOMSONI* in fruit.

*Fig. 1*, a male flower, *nat. size.* *Fig. 2*, a basal bract. *Fig. 3*, the three outer sepals. *Fig. 4*, those of the second series. *Fig. 5*, those of the third series. *Fig. 6*, those of the fourth series. *Fig. 7*, the three inner sepals. *Fig. 8*, the three outer petals. *Fig. 9*,

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the three inner petals, with their basal teeth. *Fig. 10*, the six stamens. *Fig. 11*, the galeated stamens shown in different positions. *Fig. 12*, a transverse section of a stamen, to show the position of the anther-cells. *Fig. 13*, the three sterile ovaries: *all magnified to the same scale*. *Fig. 14*, a fruit, *nat. size*. *Fig. 15*, the same, shown endways. *Fig. 16*, half of the pericarp removed, to show the putamen imbedded in its fleshy substance, and covered with innumerable, long, delicately membranous, flat hairs: *both nat. size*. *Fig. 17*, one of the hairs, *nat. size*. *Fig. 18*, the same, seen on its side and edge-ways, *much magnified*. *Fig. 19*, a longitudinal section of the coriaceous putamen, showing its bimarsumiate cell, formed by a condylar incomplete septum. *Fig. 20*, a transverse section of the same, showing the two incomplete cells. *Fig. 21*, a longitudinal section of the same, close to the septum, on the top of which the seed is attached. *Fig. 22*, the seed extracted, covered by its thin membranaceous integument, attached at its sinus to the top of the septum. *Fig. 23*, the exalbuminous embryo, deprived of its integument. *Fig. 24*, the same, showing its large, fleshy, hippocrepiform, *accumbent* cotyledons, and the very short terete radicle: *all nat. size*.

PLATE 135.—PACHYGONE OVATA.

A portion of a branch of the male plant in flower, and another of the female plant of PACHYGONE PLUKENETTI in flower and in fruit.

*Fig. 1*, a portion of the male raceme, *magnified*. *Fig. 2*, a male flower, *nat. size*. *Fig. 3*, the three outer sepals. *Fig. 4*, the three inner sepals. *Fig. 5*, the six petals, with inflected basal lobes. *Fig. 6*, the six stamens: *all equally magnified*. *Fig. 7*, a stamen, in different positions, before dehiscence. *Fig. 8*, the same, after dehiscence: *both more magnified*. *Fig. 9*, a portion of the female inflorescence, *magnified*. *Fig. 10*, a female flower, *nat. size*. *Fig. 11*, the three outer sepals. *Fig. 12*, the three inner sepals. *Fig. 13*, the six petals, similar to those of the male. *Fig. 14*, the six sterile stamens: *all equally magnified*. *Fig. 15*, a sterile stamen, *more magnified*. *Fig. 16*, the three ovaries, *magnified* (as in *fig. 14*). *Fig. 17*, a drupe. *Fig. 18*, its putamen, seen on its face. *Fig. 19*, the same, shown on its edge: *all nat. size*. *Fig. 20*, the reniform osseous putamen, with a small external aperture near the sinus leading into one of the small chambers of the condyle. *Fig. 21*, the same, viewed on its edge, showing the peripheral line of suture. *Fig. 22*, a longitudinal section of the same, showing the cyclical cell of the seed surrounding the condyle, in which is seen one of its small chambers. *Fig. 23*, a transverse section of the same through the two chambers of the condyle, showing the two channels leading into them from the external apertures. *Fig. 24*, the seed extracted, with its membranaceous integument expanded in its sinus, where it is insinuated into the fissure of the condyle. *Fig. 25*, the exalbuminous embryo, deprived of its integument. *Fig. 26*, the same, seen endways, to show the large, fleshy, *accumbent* cotyledons, with the small conical radicle. *Fig. 27*, the same, with the cotyledons separated: *all magnified to the same scale*.

PLATE 136.—PLEOGYNE CUNNINGHAMI.

A branch of the female plant in fruit.

*Fig. 1*, an axillary bracteated raceme where only one terminal flower remains, *nat. size*. *Fig. 2*, the flower from which all the sepals and petals have fallen, leaving six conniving ovaries on the gynæcium. *Fig. 3*, a single ovary, showing the cicatrices on the gynæcium,



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the others being removed. *Fig. 4*, a section of the same, showing the attachment of its ovule: *all magnified*. *Fig. 5*, an axillary female raceme bearing six drupes, the product of a single flower. *Fig. 6*, a drupe on the receptacle, from which the others have been removed: *both nat. size*. *Fig. 7*, a drupe, *magnified*. *Fig. 8*, its putamen. *Fig. 9*, a longitudinal section of the same, with the seed removed. *Fig. 10*, a transverse section of the same, showing the condyle. *Fig. 11*, the seed covered by its membranaceous integument, which is expanded in the sinus, where it is insinuated between the plates of the condyle. *Fig. 12*, the exalbuminous embryo deprived of the integument. *Fig. 13*, the same, viewed on its edge, showing that the cotyledons are *accumbent*. *Fig. 14*, the same, the cotyledons being distinct, united to a small superior radicle: *all magnified to the same scale*.

PLATE 137.—MICROCLISIA AUSTRALIS.

A portion of a branch of the male plant in flower.

*Fig. 1*, a branchlet of the panicle. *Fig. 2*, a flower: *both nat. size*. *Fig. 3*, the same, *magnified*. *Fig. 4*, the three outer sepals. *Fig. 5*, those of the second series. *Fig. 6*, those of the third series. *Fig. 7*, those of the fourth series. *Fig. 8*, those of the fifth or inner series, which are much larger, with a subvalvate æstivation. *Fig. 9*, the three stamens almost concealed within the six petals: *all magnified to the same scale*. *Fig. 10*, the three outer petals. *Fig. 11*, the three inner petals. *Fig. 12*, the three stamens enclosed within the six petals: *all more magnified*. *Fig. 13*, the three central stamens before dehiscence. *Fig. 14*, the same after dehiscence: *both still more magnified*.

PLATE 138.—SCIADOTENIA CAYENNENSIS.

A portion of a branch of the male plant in fruit.

*Fig. 1*, a single flower, with its persistent sepals on the summit of the long pedicel, and bearing seven carpophora, each supporting a drupe. *Fig. 2*, the sepals, and the gynæcium bearing eight (sometimes sixteen) ovaries, seven of which are sterile and only one fertile, which is carried up gradually upon its lengthened carpophorum: *both nat. size*. *Fig. 3*, one of the sterile ovaries, *magnified*. *Fig. 4*, a drupe, *nat. size*. *Fig. 5*, a drupe, *magnified*. *Fig. 6*, its putamen. *Fig. 7*, a longitudinal section of the same along the line of suture, showing the cell of the seed and the ventral condyle. *Fig. 8*, a transverse section of the same, showing the fissure between the two plates of the condyle where the seed is attached. *Fig. 9*, the seed, covered by its membranaceous integument, expanded at its sinus, where it is insinuated between the plates of the condyle. *Fig. 10*, the exalbuminous embryo deprived of its integument. *Fig. 11*, the same, seen edgewise. *Fig. 12*, the *accumbent* fleshy cotyledons separated, showing the small connecting radicle: *all equally magnified*.

PLATE 139.—TRICLISIA PATENS.

A portion of a branch of the male plant.

*Fig. 1*, several fasciculated axillary panicles, out of the leafless node of an old branch. *Fig. 2*, a single male flower. *Fig. 3*, the same, expanded: *all nat. size*. *Fig. 4*, the same, *magnified*. *Fig. 5*, the three outer sepals. *Fig. 6*, those of the second series. *Fig. 7*,

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those of the third series. *Fig. 8*, those of the fourth or inner series, unguiculate at base and with valvate aestivation. *Fig. 9*, the three stamens, with the three minute opposite petals upon the andrœcium, from which the twelve sepals have been removed. *Fig. 10*, the three petals upon the andrœcium. *Fig. 11*, the andrœcium, surmounted by a tuft of long hairs. *Fig. 12*, the three petals, separated: *all magnified to the same scale.* *Fig. 13*, a petal. *Fig. 14*, the three stamens, showing their excurrent connective: *both more magnified.*

PLATE 140.—TRICLISIA SUBCORDATA.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, one of the capitate heads of flowers on its pedicel, bracteolated at base, *nat. size.* *Fig. 2*, the same, *magnified.* *Fig. 3*, the three outer sepals. *Fig. 4*, those of the second series. *Fig. 5*, those of the third series. *Fig. 6*, those of the fourth or inner series, valvate in aestivation. *Fig. 7*, the six petals. *Fig. 8*, the six stamens, with the six scale-like opposite petals at their base: *all equally magnified.* *Fig. 9*, the six petals. *Fig. 10*, the six stamens, showing their excurrent connective. *Fig. 11*, the andrœcium, showing the cicatrices left by the fall of the stamens and sepals, and surmounted by a tuft of long hairs: *all more magnified.* *Fig. 12*, a female flower, *nat. size.* *Fig. 13*, the same, *magnified.* *Fig. 14*, the three outer sepals. *Fig. 15*, those of the second series. *Fig. 16*, those of the third series. *Fig. 17*, the fourth or inner series of sepals, with valvate aestivation. *Fig. 18*, the six ovaries: *all equally magnified.* *Fig. 19*, one of the ovaries upon the gynœcium, from which the others have been removed, showing also the central tuft of hairs, *more magnified.* *Fig. 20*, a drupe, *nat. size.* *Fig. 21*, the same, *magnified.* *Fig. 22*, its thin testaceous putamen. *Fig. 23*, the same, showing the three longitudinal ridges on its dorsal side. *Fig. 24*, a longitudinal section of the same, showing the reniform cell and the transverse septiform intruding condyle, to the margin of which the seed is attached. *Fig. 25*, a transverse section of the same, showing the transversely septiform condyle, which is an expansion of the deep fissure or chink on the ventral face of the seed, around which the thin integument is inflected, and is there attached to the margin of the condyle. *Fig. 26*, the exalbuminous embryo deprived of its integument, showing the gigantic superior fleshy radicle, which forms half of the seed, and which is inflected at its apex, the lower half being formed of the two fleshy *accumbent* cotyledons. *Fig. 27*, a side view of the same, showing at the foot of the radicle the deep chink which embraces the condyle. *Fig. 28*, the same seen on its ventral face, with the cotyledons separated to show their depth: *all magnified to the same scale.*

PLATE 141.—PYCNARRHENA PLENIFLORA.

A portion of a branch of the male plant in flower, and another of the female plant in fruit.

*Fig. 1*, one of the fasciculated peduncles, supporting a single pedicellated male flower. *Fig. 2*, the same, with two flowers: *both nat. size.* *Fig. 3*, a flower expanded, *magnified.* *Fig. 4*, the three outer sepals. *Fig. 5*, the three intermediate sepals. *Fig. 6*, the three inner sepals. *Fig. 7*, the six petals concealing the stamens. *Fig. 8*, the six petals separated. *Fig. 9*, the nine stamens, in three series: *all magnified to the same scale.*

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*Fig. 10*, a stamen, shown in three different positions, before dehiscence. *Fig. 11*, the same after dehiscence: *both more magnified*. *Fig. 12*, a diagram to show the triserial arrangement of the floral parts. *Fig. 13*, six fasciculated pedicels, each terminated by a receptacle from which the drupes have fallen. *Fig. 14*, one of three drupes seated on the receptacle: *all nat. size*. *Fig. 15*, a drupe, *magnified*. *Fig. 16*, its putamen. *Fig. 17*, a longitudinal section of the same, showing the condyle. *Fig. 18*, a transverse section of the same. *Fig. 19*, the exalbuminous embryo deprived of its integument. *Fig. 20*, the same, seen on its edge, showing its large *accumbent* cotyledons and minute superior radicle. *Fig. 21*, the same, with the cotyledons displayed: *all equally magnified*.

#### PLATE 142.—ANTITAXIS FASCICULATA.

A branch of the male plant in flower, and another of *ANTITAXIS LUCIDA* in fruit.

*Fig. 1*, one of the fasciculated flowers on its pedicel, *nat. size*. *Fig. 2*, the two outer opposite sepals. *Fig. 3*, the two decussately opposite sepals of the second series. *Fig. 4*, the two sepals of the third series. *Fig. 5*, those of the fourth series, all in decussating opposite pairs. *Fig. 6*, the two opposite petals. *Fig. 7*, the four stamens in decussating pairs: *all magnified to the same scale*. *Fig. 8*, the stamens before and after dehiscence, *more magnified*. *Fig. 9*, a diagram showing the decussating arrangement, in opposite pairs, of all the floral parts. *Fig. 10*, a drupe on the receptacle, from which the others have fallen: *nat. size*. *Fig. 11*, a drupe, *magnified*. *Fig. 12*, its putamen. *Fig. 13*, a longitudinal section of the same, with the ventral condyle, the seed being removed. *Fig. 14*, a transverse section of the same. *Fig. 15*, the seed extracted, with its membranaceous integument expanded in its sinus, where it is insinuated between the plates of the condyle. *Fig. 16*, the exalbuminous embryo deprived of its integument. *Fig. 17*, the same, seen edgewise, to show that the cotyledons are *accumbent*. *Fig. 18*, the same, with the fleshy cotyledons displayed, united by the small radicle: *all magnified to the same scale*.

#### PLATE 143.—SPIROSPERMUM PENDULIFLORUM.

A portion of a branch of the male plant in flower.

*Fig. 1*, a pedicellated male flower, *nat. size*. *Fig. 2*, the three outer sepals. *Fig. 3*, the three inner sepals. *Fig. 4*, the six petals. *Fig. 5*, the three free and three monadelphous stamens. *Fig. 6*, the same, separated: *all equally magnified*. *Fig. 7*, a petal, with inflected margin. *Fig. 8*, the three free stamens. *Fig. 9*, the three monadelphous stamens: *all more magnified*.

#### PLATE 144.—SPIROSPERMUM PENDULIFLORUM.

A portion of a branch of the female plant in fruit.

*Fig. 1*, a single female flower on a pedicel, bearing on its receptacle nine stipitated drupes. *Fig. 2*, a drupe, seen on its face. *Fig. 3*, the same, edgewise. *Fig. 4*, a transverse section of the same, showing the cavities formed by the spiral coils of the cell. *Fig. 5*, a longitudinal section of the same, showing the hollow spiral cell consisting of three coils. *Fig. 6*, the seed found in a fruit not quite mature. *Fig. 7*, the same, terete embryo

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with its *accumbent* cotyledons, not yet half the size of the existing cell: *all nat. size.* Fig. 8, the condition which the seed may be supposed to attain when quite ripe. Fig. 9, the same, shown edgeways: *both magnified.*

PLATE 145.—DETANDRA LATIFOLIA.

A portion of a branch in leaf, and another of an annotinous branch with male inflorescence; also a portion of a male flowering branch of DETANDRA OVATA.

Fig. 1, a male flower in bud, of the former, *nat. size.* Fig. 2, a flower, expanded, *magnified.* Fig. 3, the three sepals of the outer series. Fig. 4, the three sepals of the second series. Fig. 5, the three sepals of the third series. Fig. 6, the three sepals of the fourth series. Fig. 7, the three sepals of the inner series. Fig. 8, the six petals, in two series. Fig. 9, the petals and three monadelphous stamens, upon the andrœcium and pedicel. Fig. 10, the stamens, seen from above: *all magnified to the same scale.* Fig. 11, the anther, before and after expansion, with the free portions of the filaments, *more magnified.* Fig. 12, a male flower in bud of DETANDRA OVATA, *nat. size.* Fig. 13, the same expanded, *magnified.* Fig. 14, the three sepals of the outer series. Fig. 15, the three sepals of the second series. Fig. 16, the three sepals of the third series. Fig. 17, the three sepals of the fourth series. Fig. 18, the three sepals of the fifth series. Fig. 19, the three sepals of the inner series. Fig. 20, the six petals, in two series. Fig. 21, the petals and stamens upon the andrœcium and pedicel: *all magnified to the same scale.* Fig. 22, the three stamens, seen from above. Fig. 23, the anthers, before and after dehiscence, upon the free portions of the filaments: *both more magnified.*

PLATE 146.—SYRRHEONEMA FASCICULATUM.

A portion of the male flowering plant.

Fig. 1, one of the peduncles, bearing three sessile flowers. Fig. 2, a single male flower: *nat. size.* Fig. 3, the three outer sepals. Fig. 4, the three intermediate sepals. Fig. 5, the three inner sepals. Fig. 6, the three monadelphous stamens: *all magnified to the same scale.* Fig. 7, the three free portions of the stamen, seen in different positions, *more magnified.*

PLATE 147.—ELISSARRHENA LONGIPES.

A portion of a male flowering branch.

Fig. 1, a flower in bud, *nat. size.* Fig. 2, the three outer sepals. Fig. 3, the three intermediate sepals. Fig. 4, the three inner sepals. Fig. 5, the six petals. Fig. 7, the six stamens: *all equally magnified.* Fig. 6, a petal, seen before, behind (expanded), and sideways (embracing a stamen). Fig. 8, the same, seen in different positions, before and after dehiscence: *both more magnified.*

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PLATE 148.—SYNCLISIA SCABRIDA.

A portion of a male flowering branch.

*Fig. 1*, a male flower on its pedicel, *nat. size*. *Fig. 2*, the same, *magnified*. *Fig. 3*, the three outer sepals. *Fig. 4*, the three intermediate sepals. *Fig. 5*, the three inner sepals, with valvate aestivation, united for more than half their length into a cylindrical tube. *Fig. 6*, the same, cut open. *Fig. 7*, the six petals. *Fig. 8*, the columnar portion of the filaments, bearing the six inner stamens. *Fig. 9*, the same six inner monadelphous stamens separated from the columnar portion. *Fig. 10*, the three outer free stamens: *all equally magnified*. *Fig. 11*, a petal. *Fig. 12*, the three outer free stamens. *Fig. 13*, the six inner monadelphous stamens, *all more magnified*.

PLATE 149.—PENIANTHUS LONGIFOLIUS.

A portion of a female flowering branch.

*Fig. 1*, the supra-axillary inflorescence. *Fig. 2*, one of the flowers on its pedicel, bracteolated at base: *both nat. size*. *Fig. 3*, the three outer sepals. *Fig. 4*, the three intermediate sepals. *Fig. 5*, the three inner sepals. *Fig. 6*, the six petals. *Fig. 7*, the six free effete stamens. *Fig. 8*, one of the ovaries, seated on the gynæcium, and part of the pedicel. *Fig. 9*, the two other ovaries, removed: *all magnified to the same scale*. *Fig. 10*, the petals, stamens, ovaries, and portion of the pedicel, *somewhat less magnified*.

PLATE 150.—SELWYNIA LAURINA.

A portion of a male flowering branch.

*Fig. 1*, a flower in bud, *nat. size*. *Fig. 2*, the two sepals of the outer series. *Fig. 3*, the two sepals of the second series. *Fig. 4*, the two sepals of the third series. *Fig. 5*, the two sepals of the fourth series. *Fig. 6*, the two inner sepals. *Fig. 7*, the eight petals. *Fig. 8*, the eight free stamens: *all equally magnified*. *Fig. 9*, the eight petals, seen in different positions. *Fig. 10*, the eight free stamens: *both more magnified*.

PLATE 151.—ARISTEGA LÆVIGATA.

Portions of two male flowering branches.

*Fig. 1*, a flower in bud, *nat. size*. *Fig. 2*, the same, *magnified*. *Fig. 3*, the three outer sepals. *Fig. 4*, the three intermediate sepals. *Fig. 5*, the three inner sepals, with valvate aestivation. *Fig. 6*, the three petals. *Fig. 7*, the three free stamens: *all equally magnified*.

PLATE 152.—DESMONEMA CAFFRA.

A portion of a male flowering branch.

*Fig. 1*, a flower in bud on its pedicel, bracteated at base, *nat. size*. *Fig. 2*, the same expanded, *magnified*. *Fig. 3*, the bractlet of the pedicel. *Fig. 4*, the three outer sepals.

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*Fig. 5*, the three inner sepals. *Fig. 6*, the three outer petals. *Fig. 7*, the three inner petals. *Fig. 8*, the three monadelphous stamens: *all magnified to the same scale*. *Fig. 9*, the three stamens, the filaments for more than half their length being conjoined into a central column. *Fig. 10*, an anther, with the free portion of its filament, before and after dehiscence: *both more magnified*.

PLATE 153.—RHAPTONEMA CANCELLATA.

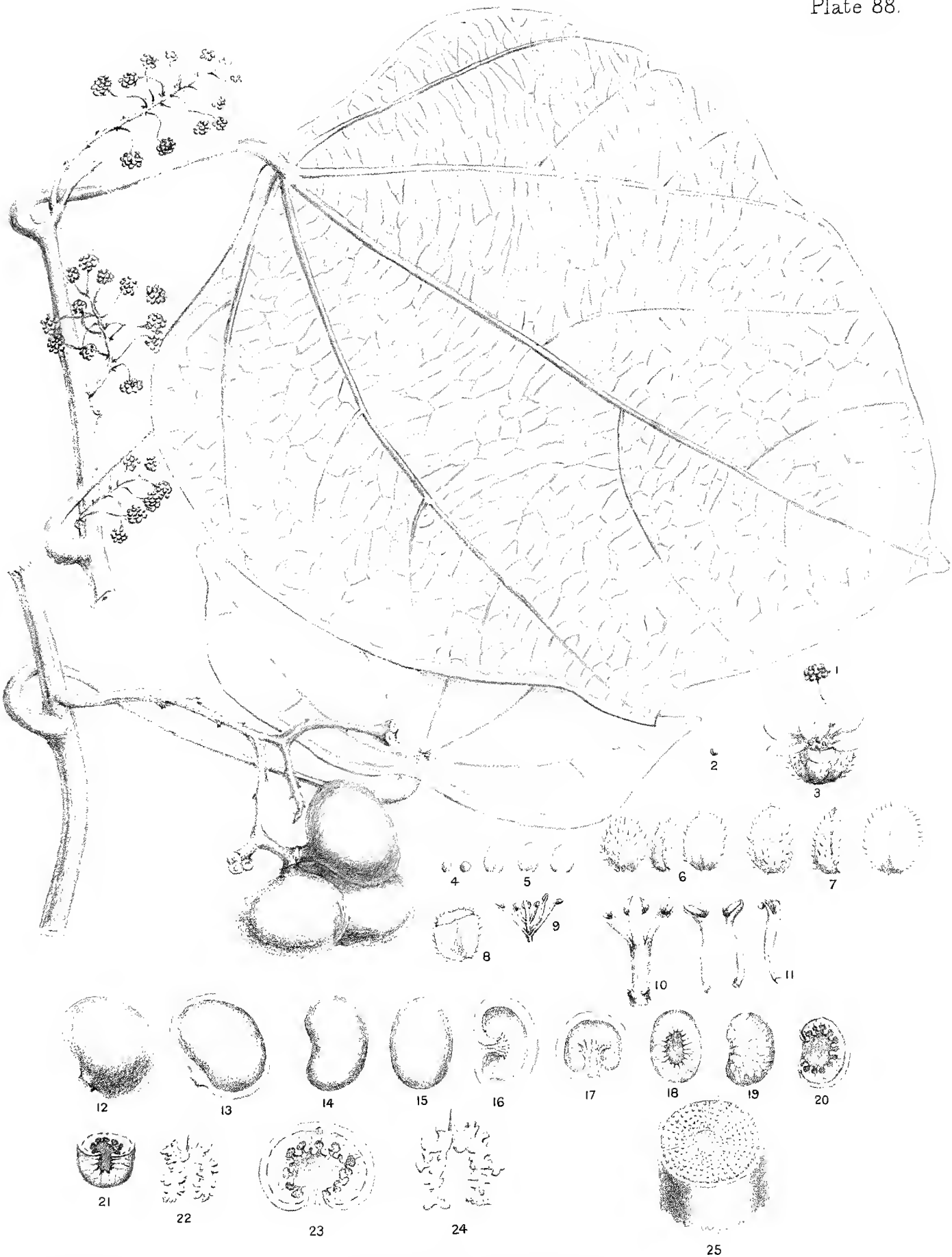
A portion of a male flowering branch.

*Fig. 1*, a male flower, expanded, *nat. size*. *Fig. 2*, the same, *magnified*. *Fig. 3*, the three outer sepals. *Fig. 4*, the three intermediate sepals. *Fig. 5*, the three inner sepals. *Fig. 6*, the six petals. *Fig. 7*, the three monadelphous stamens: *all magnified to the same scale*. *Fig. 8*, the stamens, with the filaments united for more than half their length into a central column, the three free portions each bearing an introrse anther. *Fig. 9*, one of the anthers, shown on its inner face. *Fig. 10*, the same, seen on the outer face: *all more magnified*.

PLATE 154.—SOMPHOXYLON WULLSCHLEGELII.

A portion of a branch, and a part of a male inflorescence, copied from Dr. Eichler's drawing and description.

*Fig. 1*, an ultimate branchlet of the male panicle, *nat. size*. *Fig. 2*, a portion of the same, showing its fasciculated pedicellated flowers, *magnified*. *Fig. 3*, a male pedicellated flower in bud, *nat. size*. *Fig. 4*, the same, *magnified*. *Fig. 5*, the same after expansion. *Fig. 6*, the three outer sepals, slightly connate at base, upon the pedicel. *Fig. 7*, the three inner sepals. *Fig. 8*, the six petals, in two alternate series, viewed sideways. *Fig. 9*, the same, with the included stamens, seen from above: *all equally magnified*. *Fig. 10*, the outer series of three petals. *Fig. 11*, the three inner petals. *Fig. 12*, the three monadelphous stamens, the filaments being united into a central column. *Fig. 13*, one of the extrorse anthers attached to the filament, seen on the outer face. *Fig. 14*, the same, shown on its inner face: *all more magnified*.

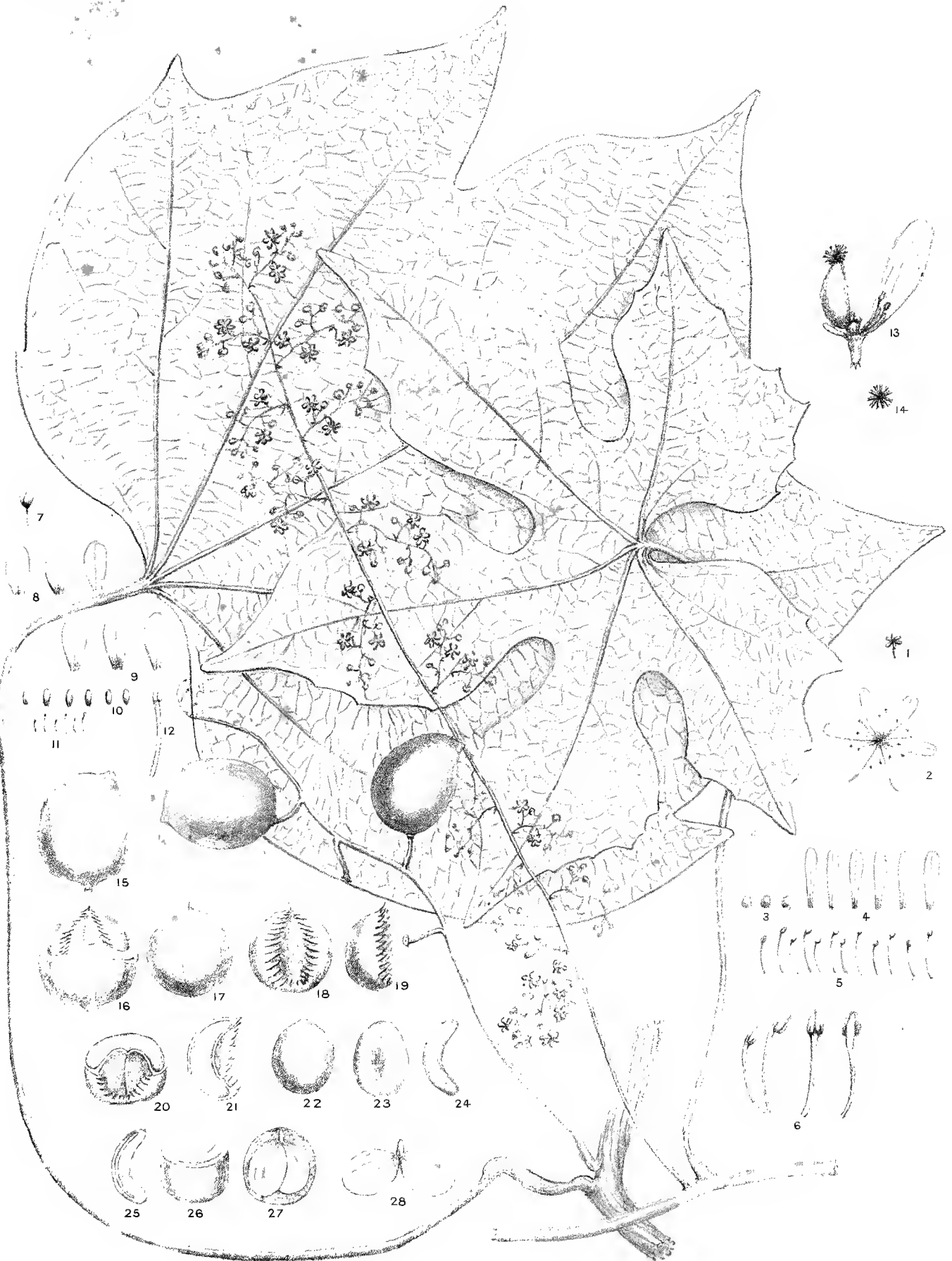


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COSCINIUM FENESTRATUM.





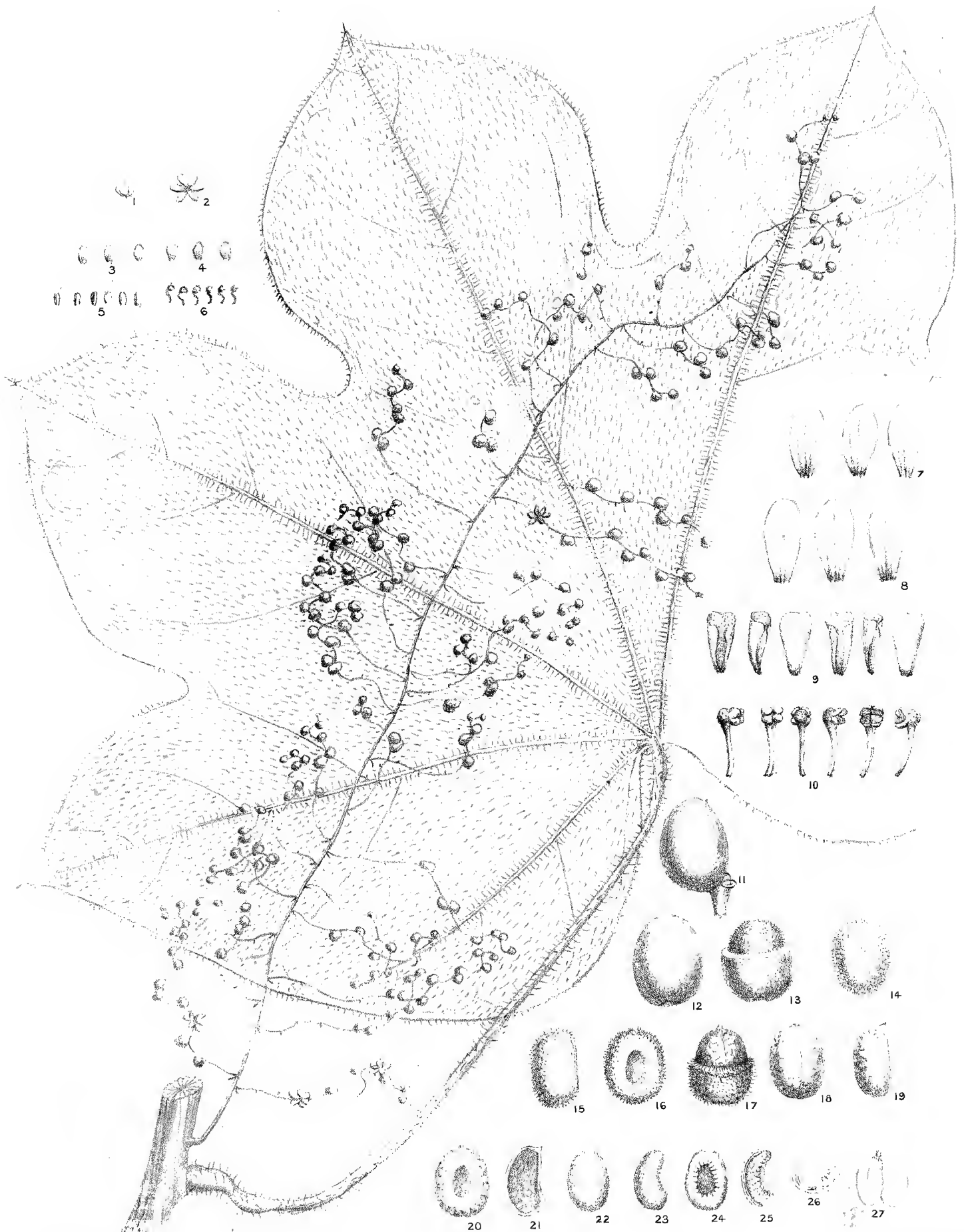


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CALYCOCARPUM LYONI.

Moore, Macmillan & Moore, 1904, *Journal of the Royal Society of New Zealand*, New Zealand, 1, p. 104.

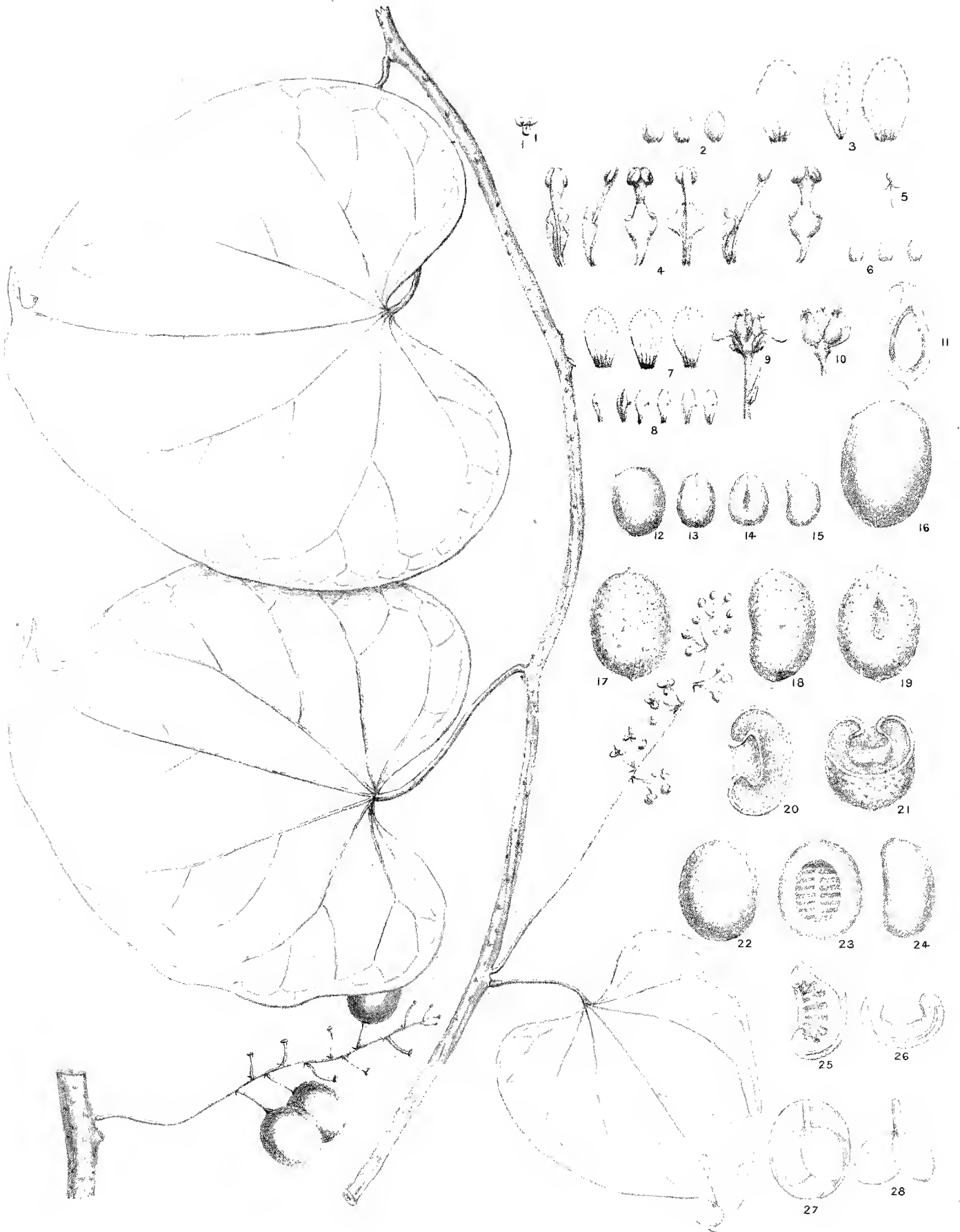




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JATEORHIZA CALUMBA.



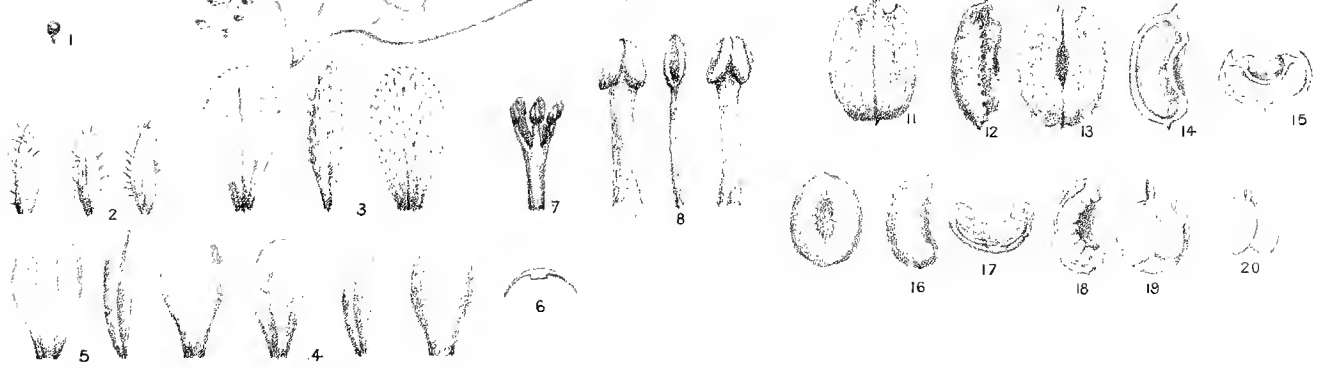


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TINOSPORA CORDIFOLIA.

M. & H. Miers, del. & lith.



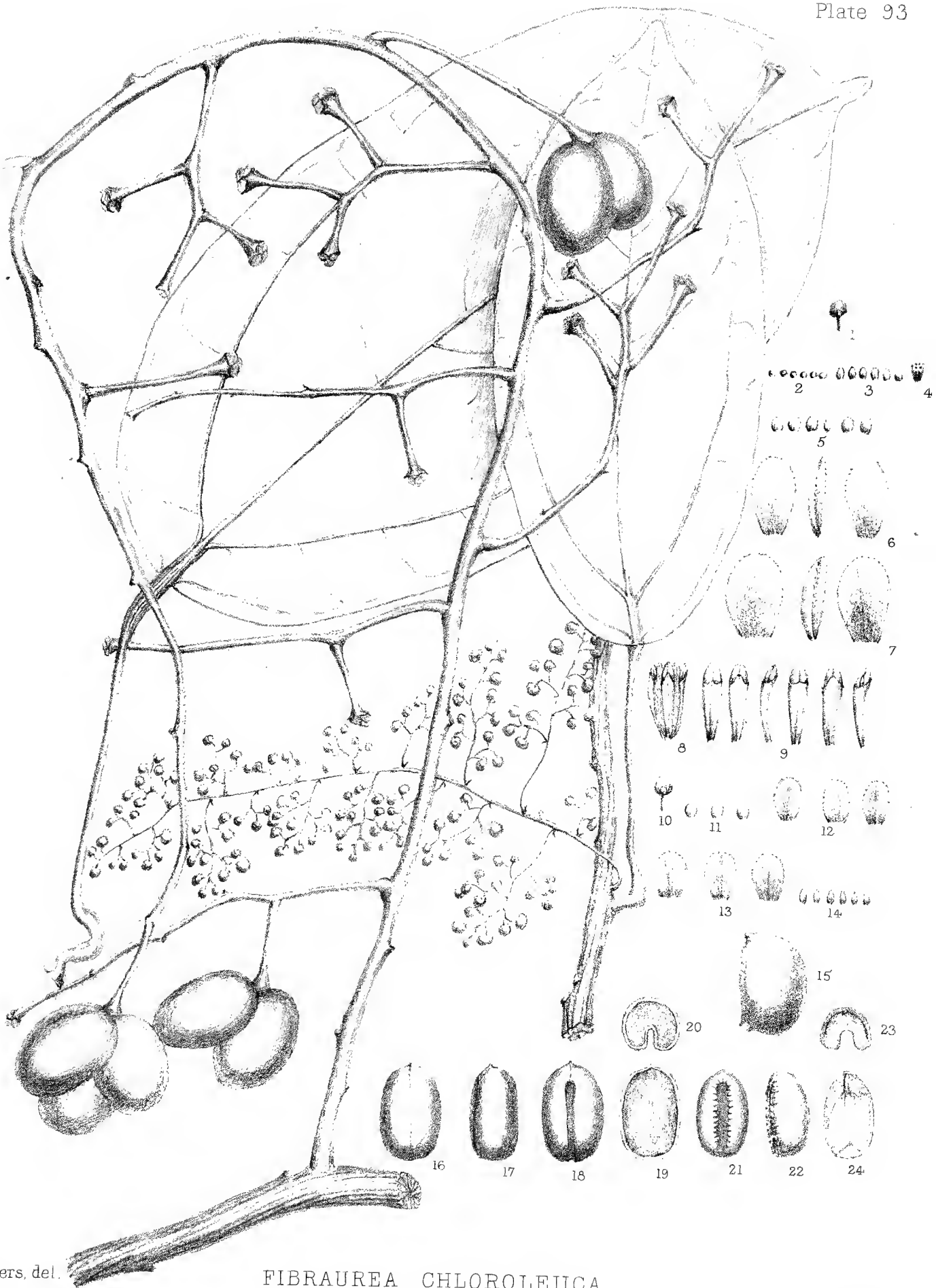


J. Miers, del.

CHASMANTHERA DEPENDENS.





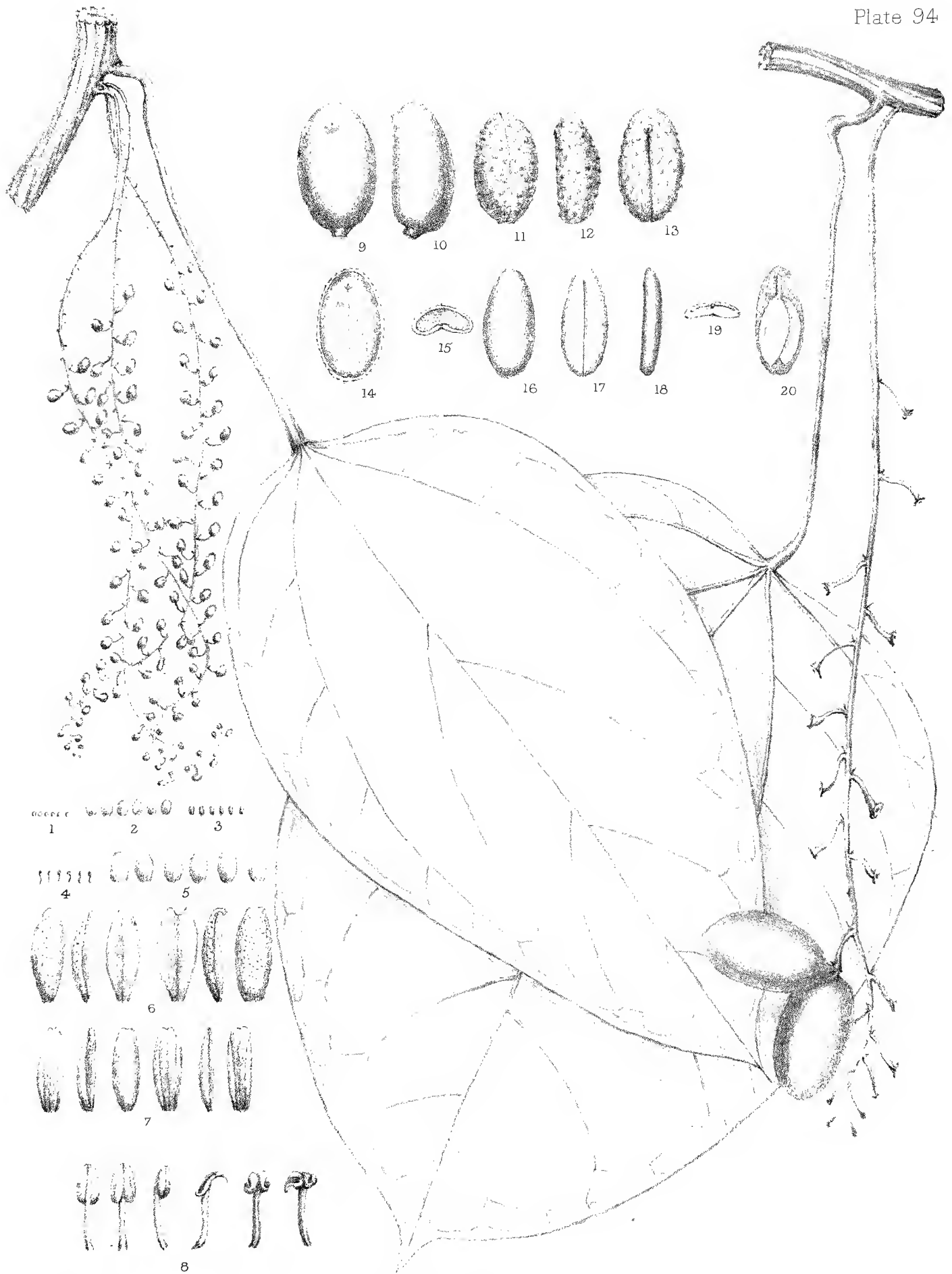


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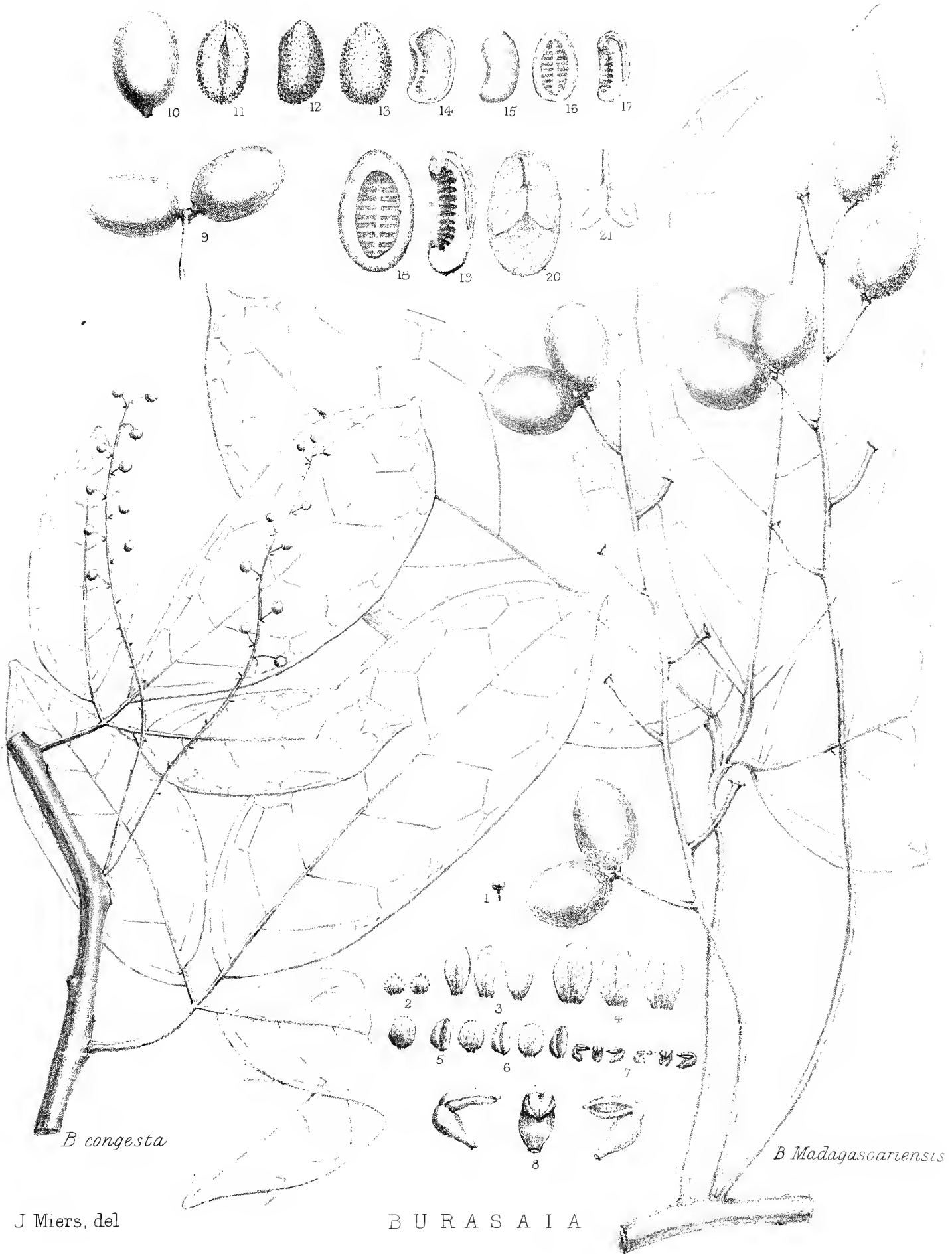
FIBRAUREA CHLOROLEUCA

Messrs. Marshall & Noddy, Ltd. in England London





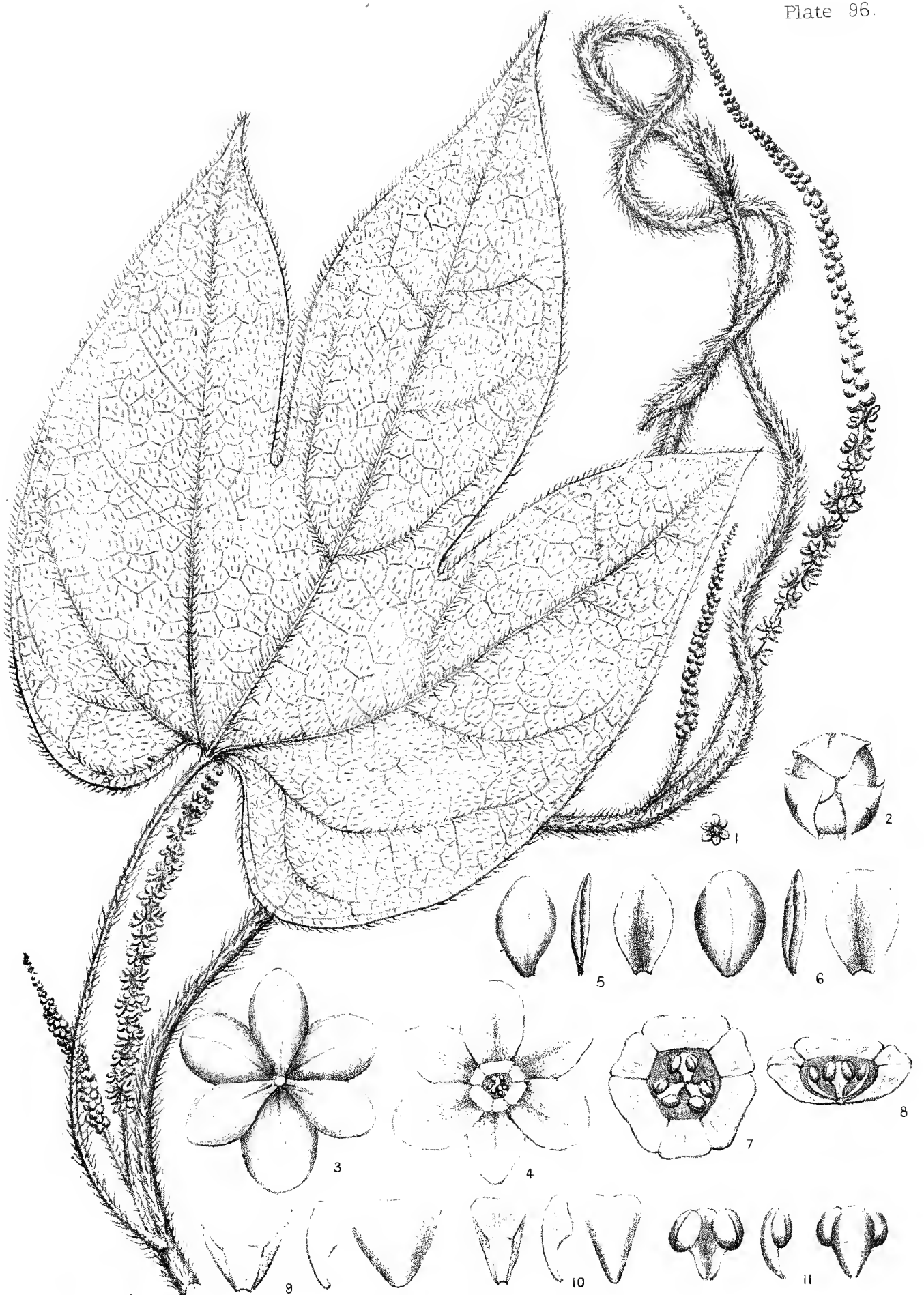




*B congesta*

*B Madagascariensis*



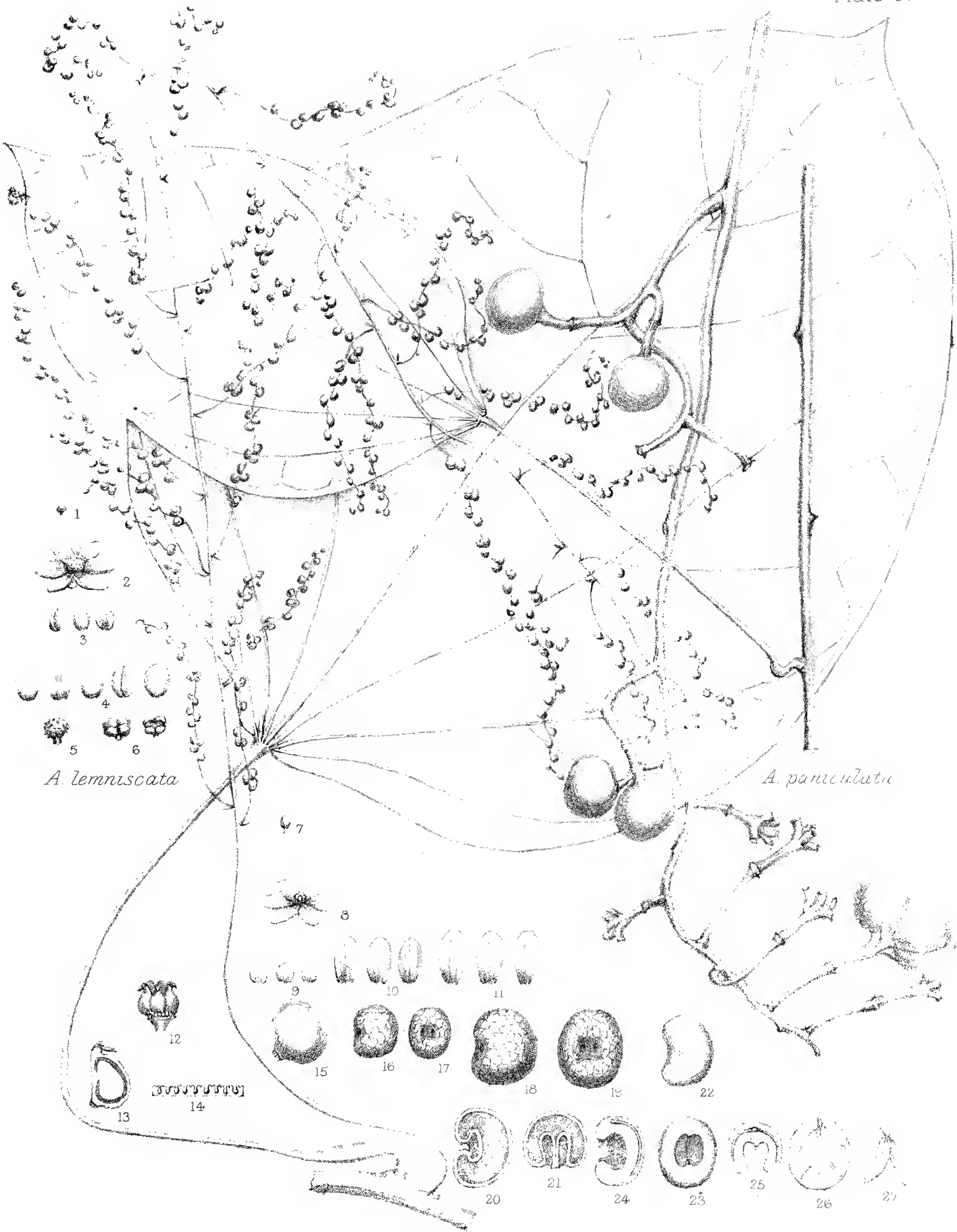


J. Miers del.

DISCIPHANIA LOBATA.



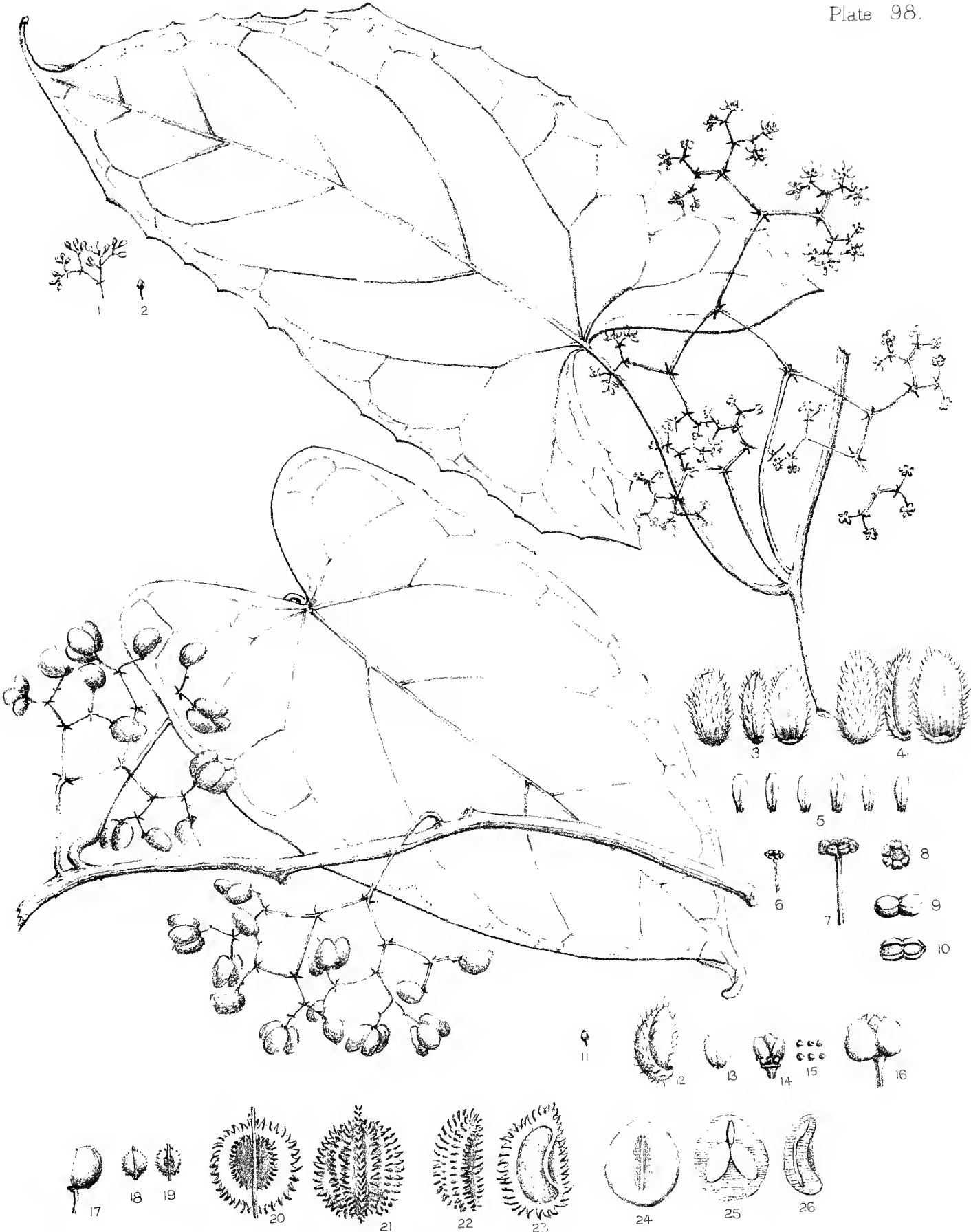




*A. lemniscata*

*A. paniculata*

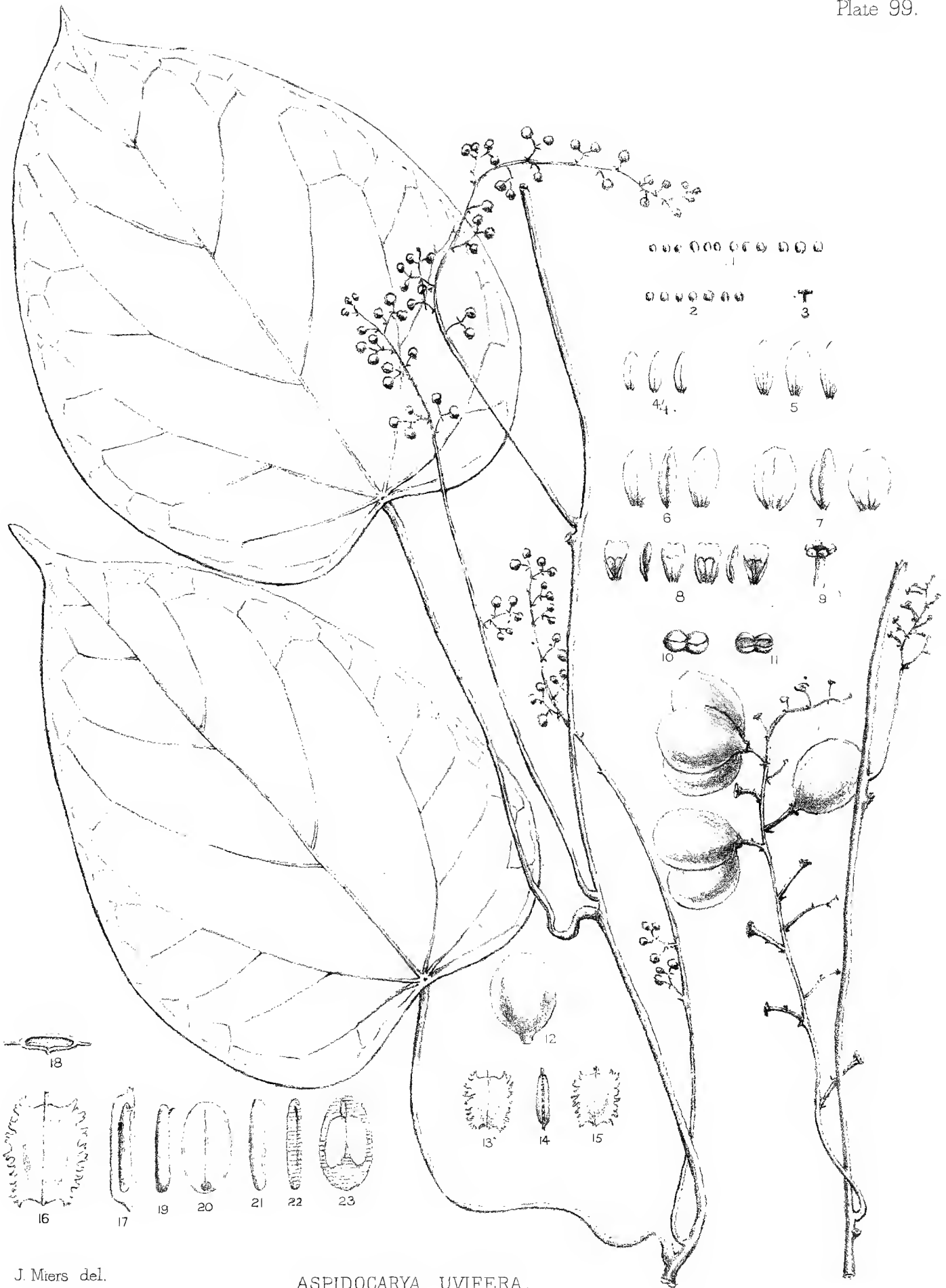




J Miers del.

PARABÆNA SAGITTATA.

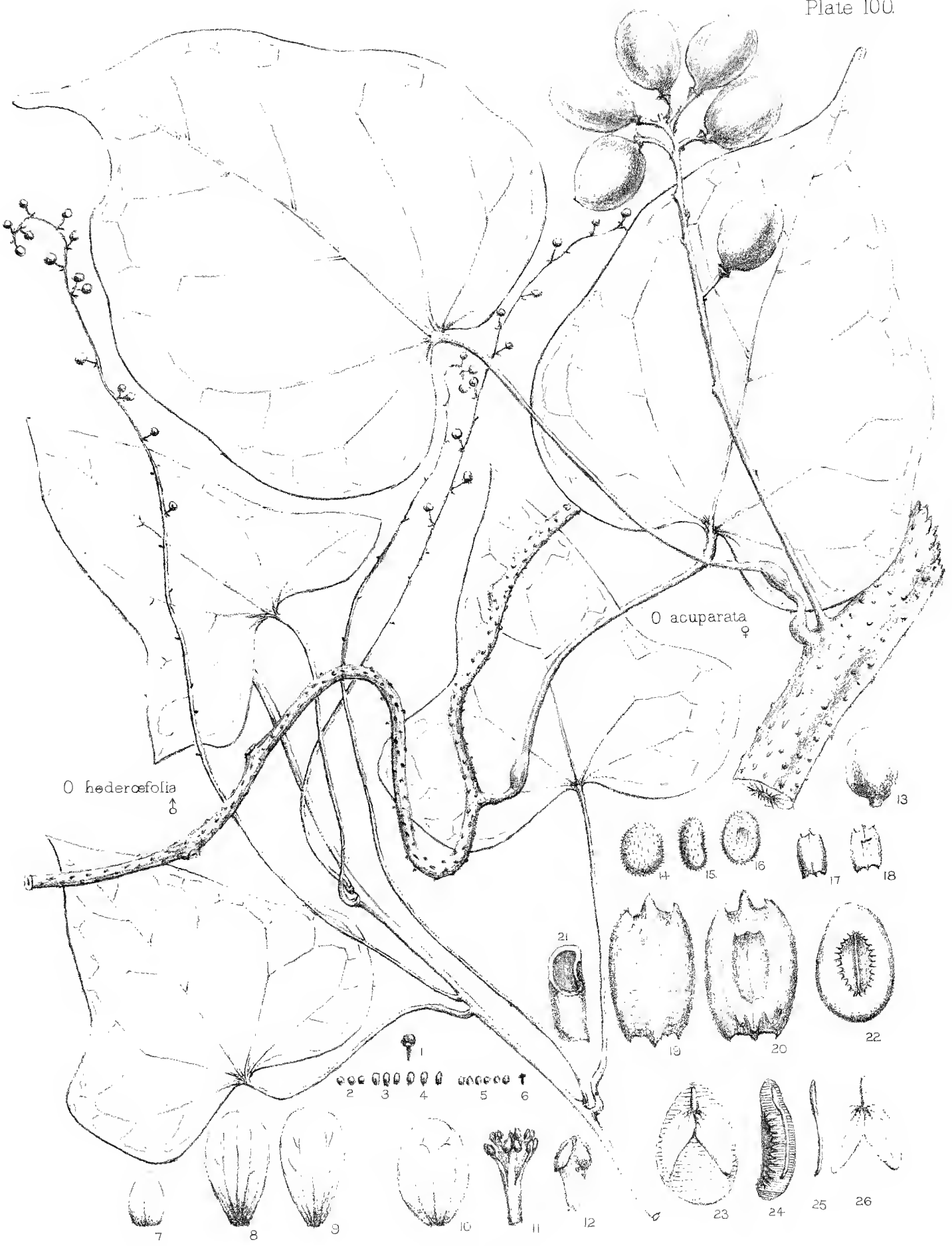




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ASPIDOCARYA UVIFERA.





*O. hederifolia* ♂

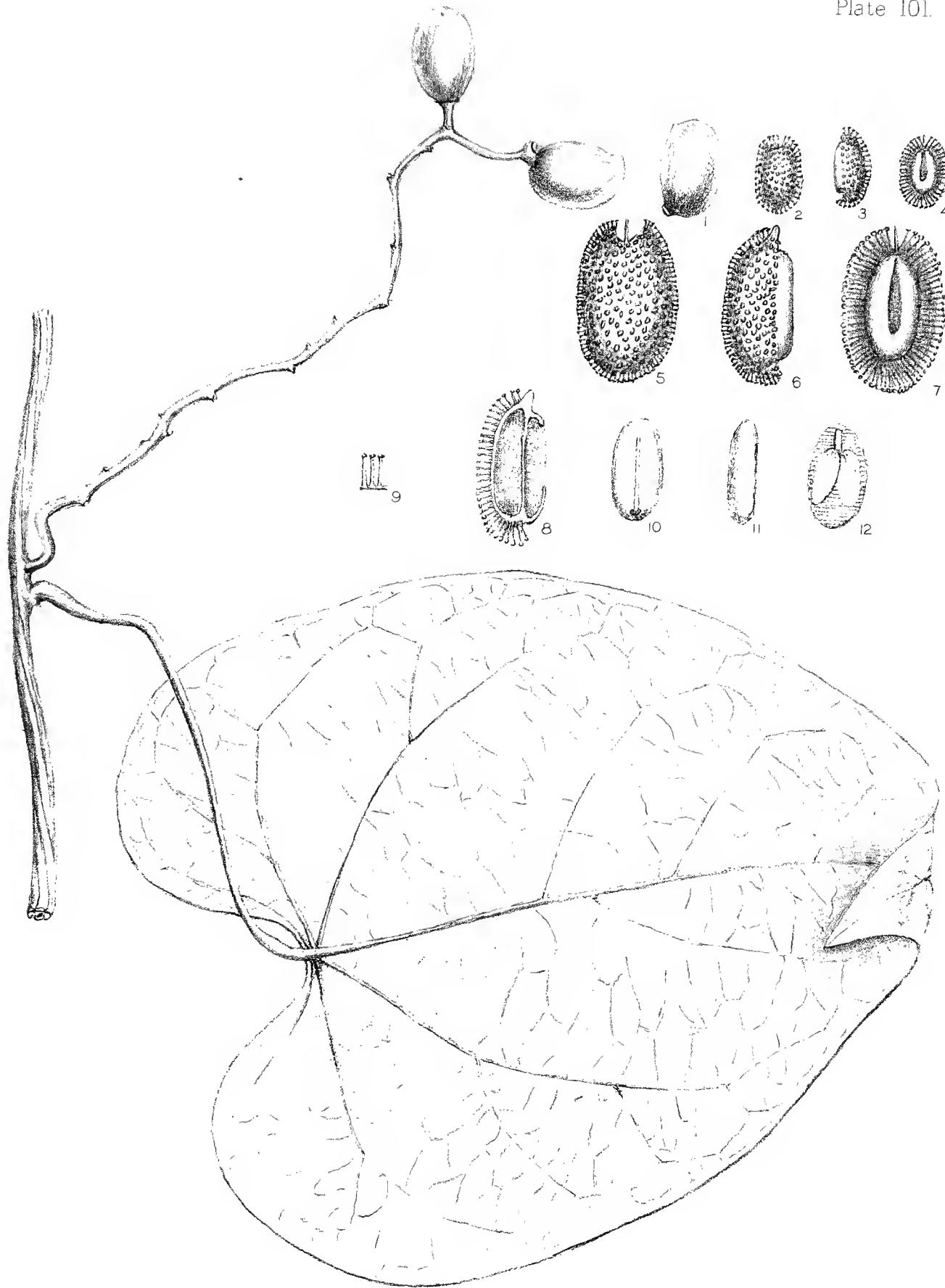
*O. acuparata* ♀

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ODONTOCARYA.



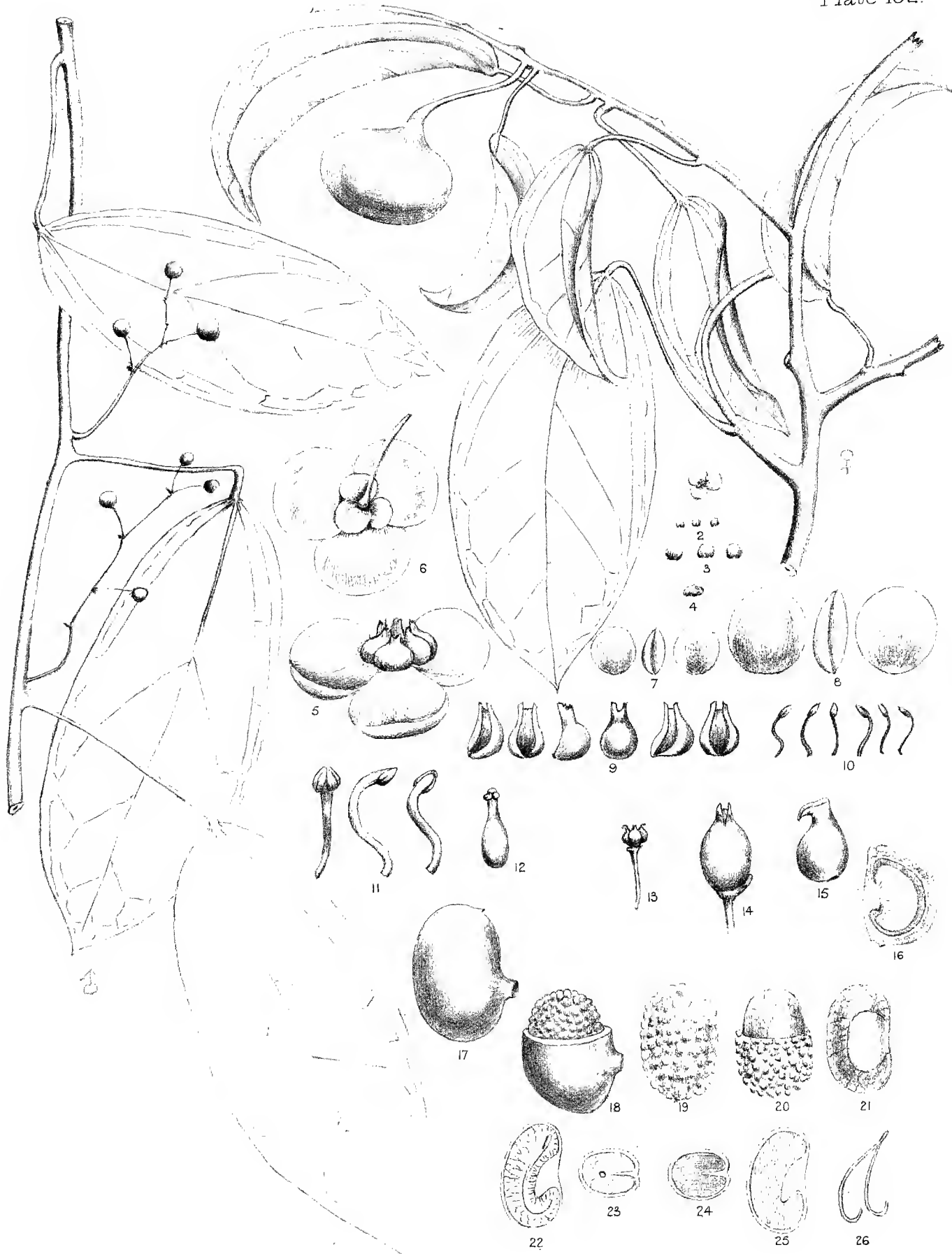




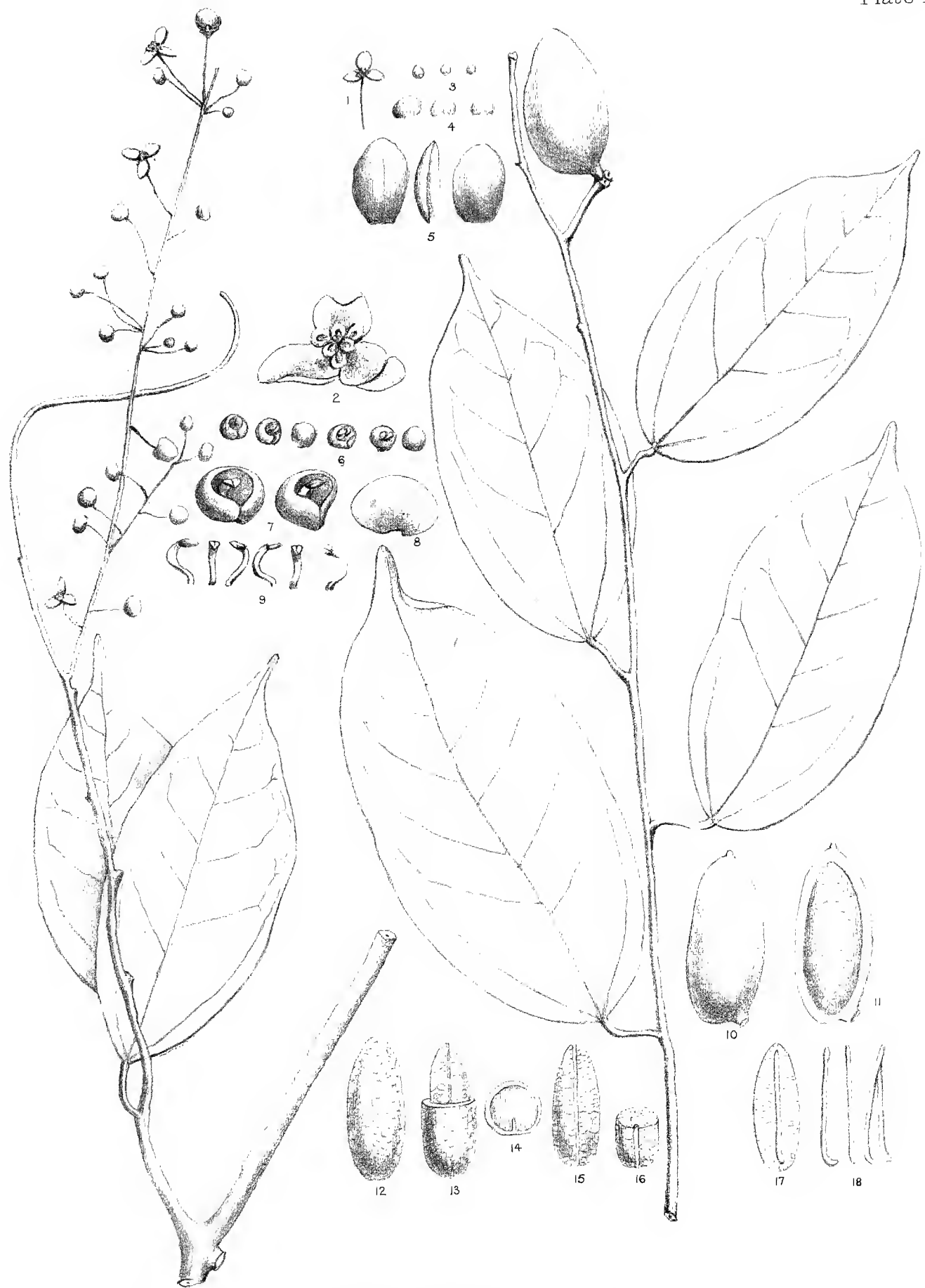
J. Miers del.

RHIGIOCARYA RACEMIFERA.





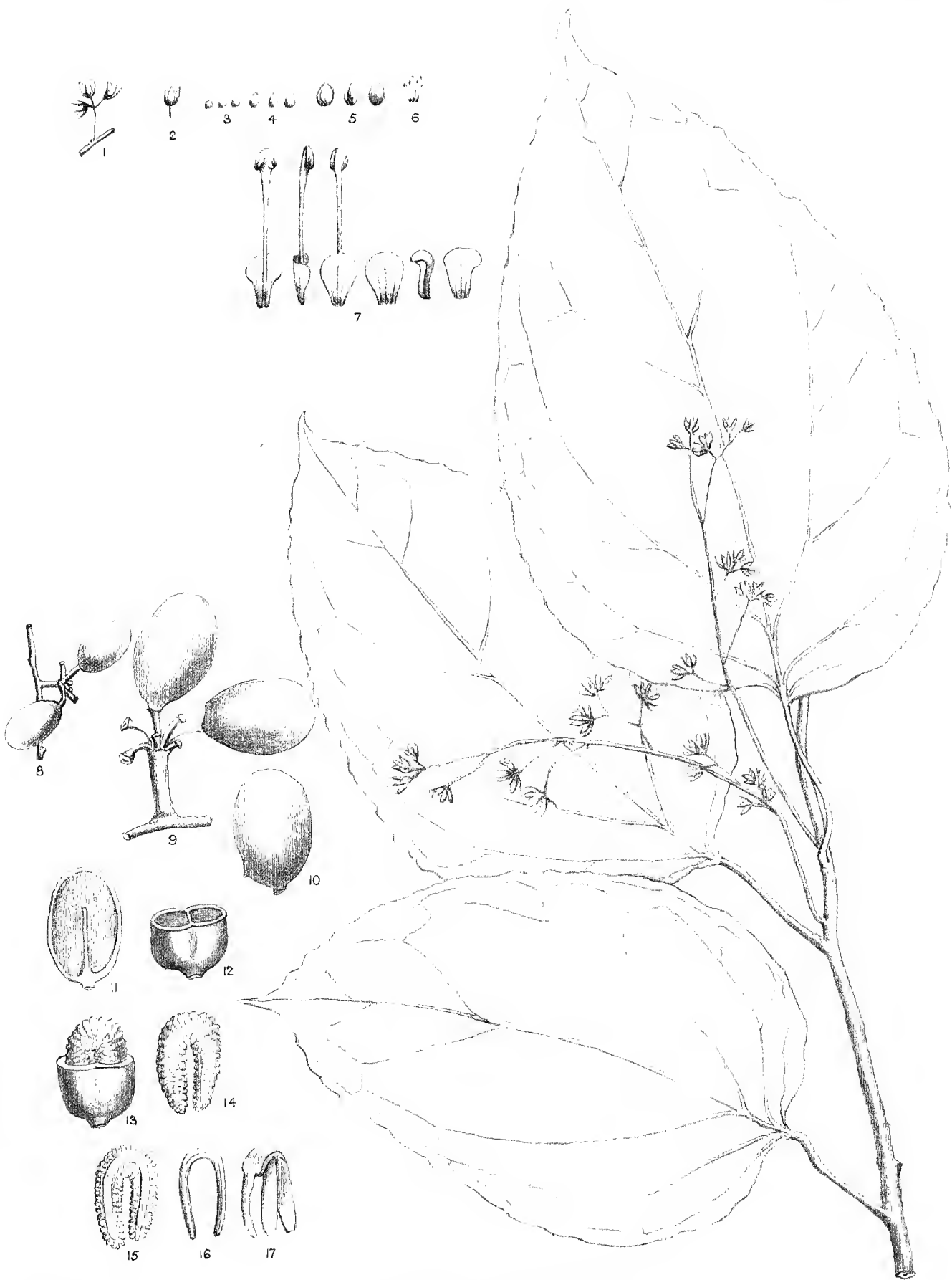




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ANOMOSPERMUM LUCIDUM.



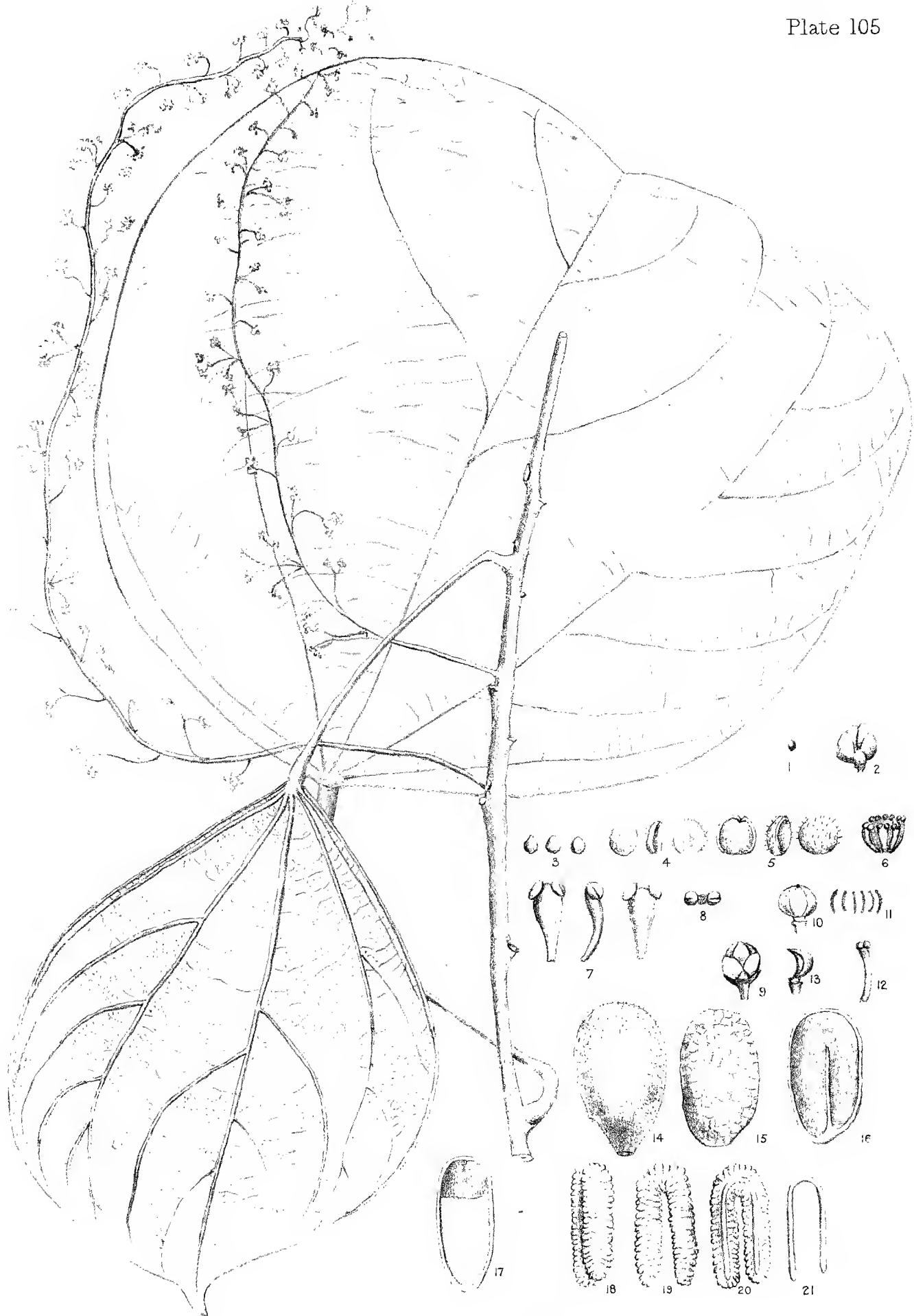


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TILIACORA RACEMOSA.



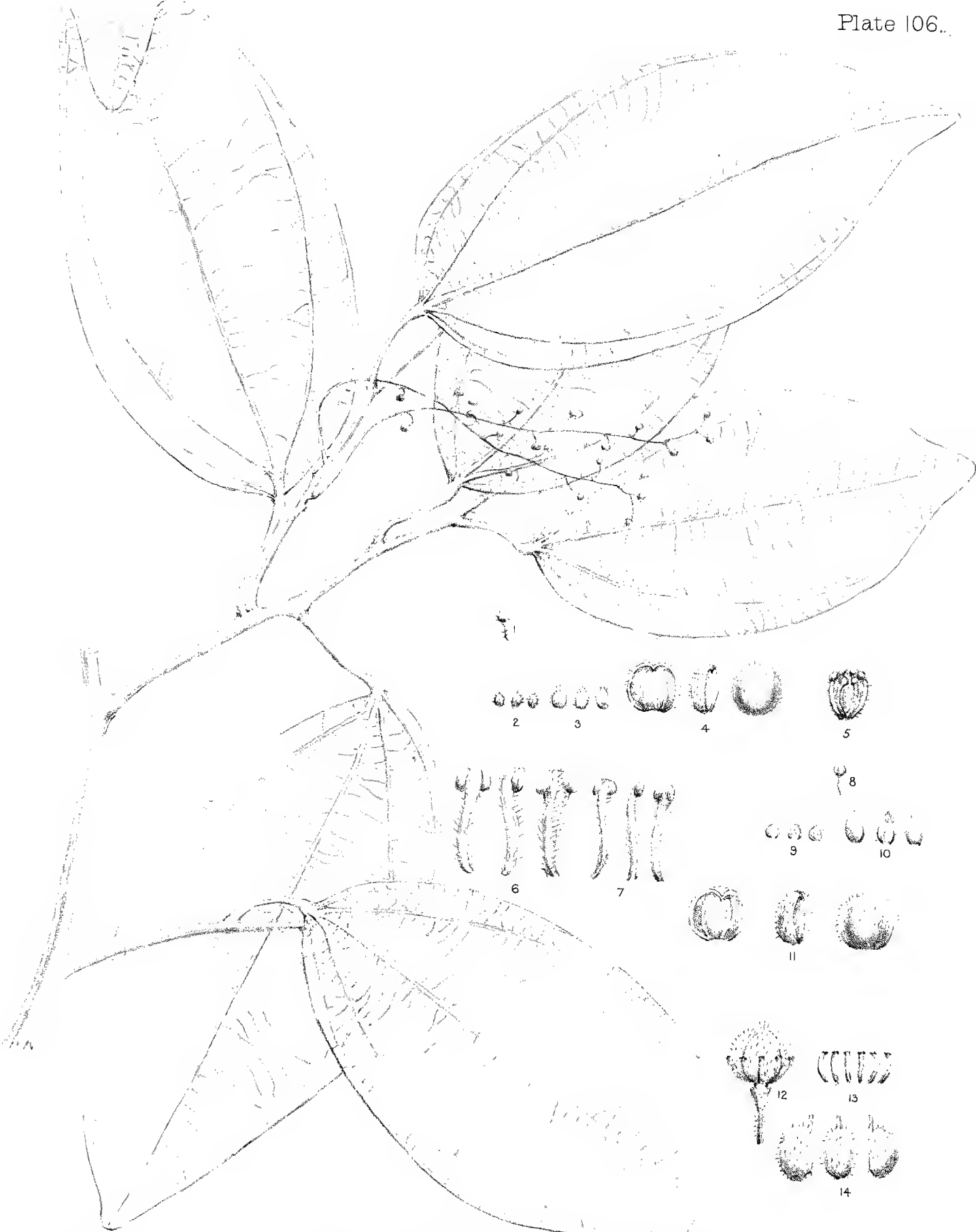




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ABUTA HETEROPHYLLA

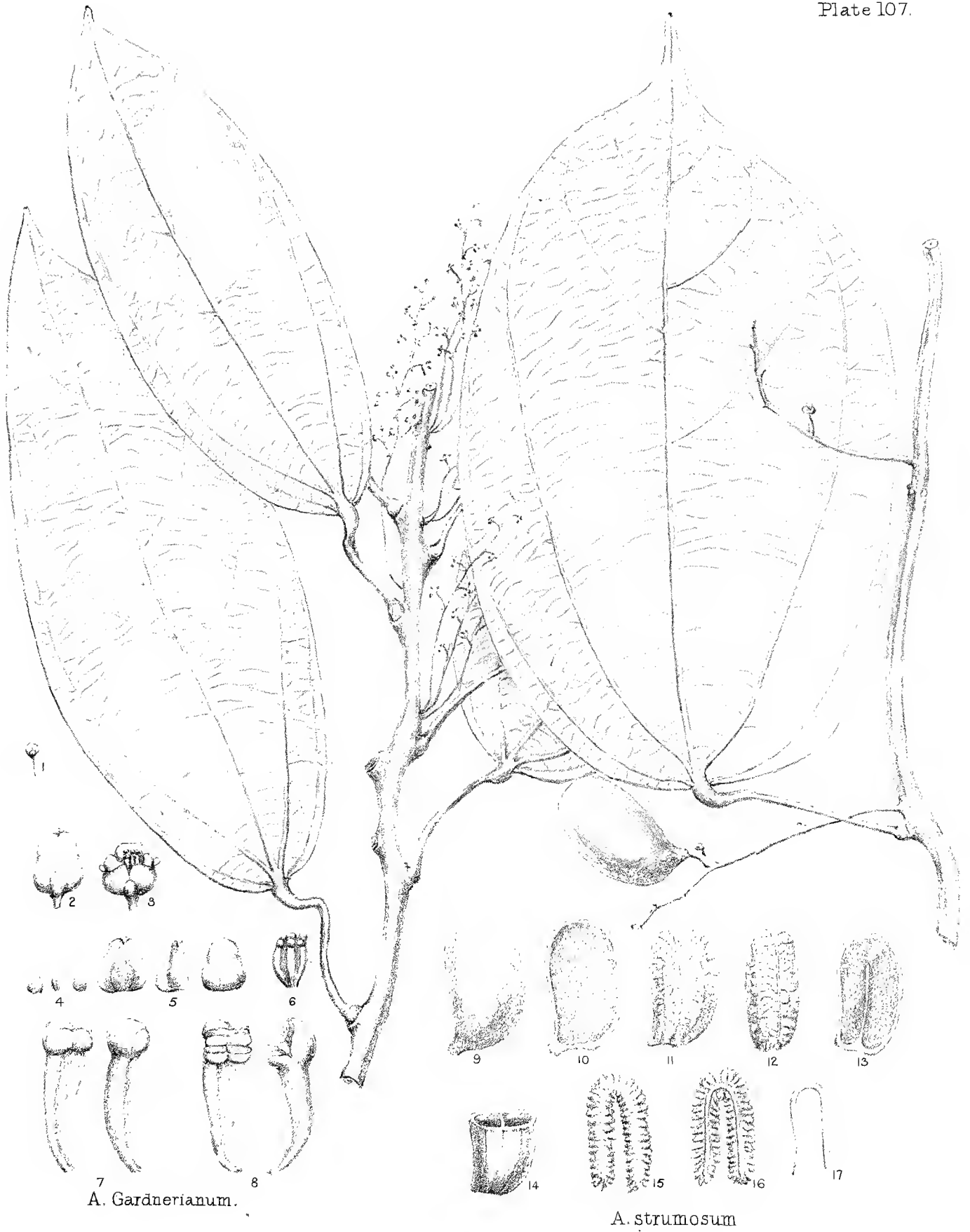




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ABUTA (BATSCHIA) RACEMOSA.





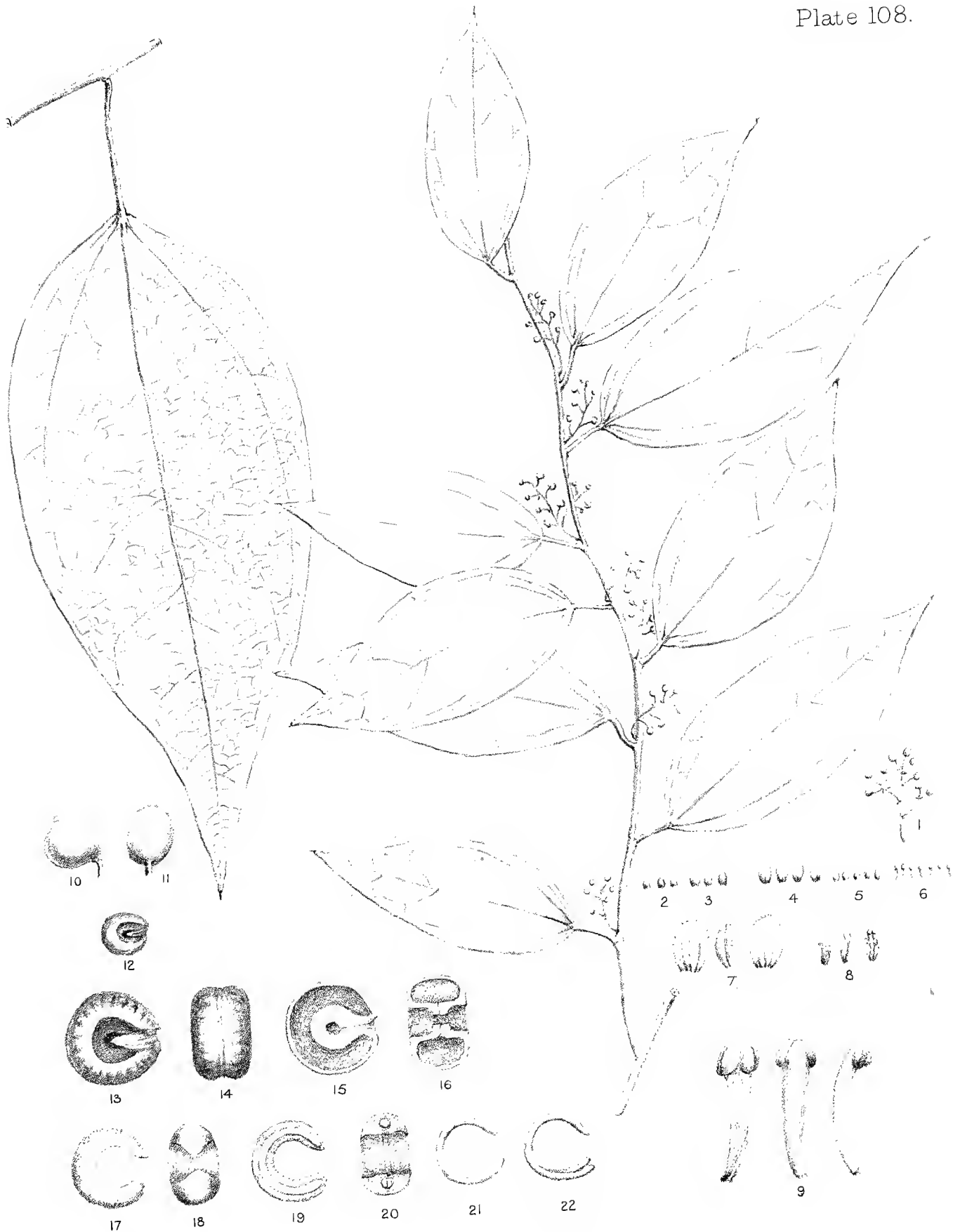
*A. Gardnerianum*.

*A. strumosum*

J. Miers, del.

ANELASMA.



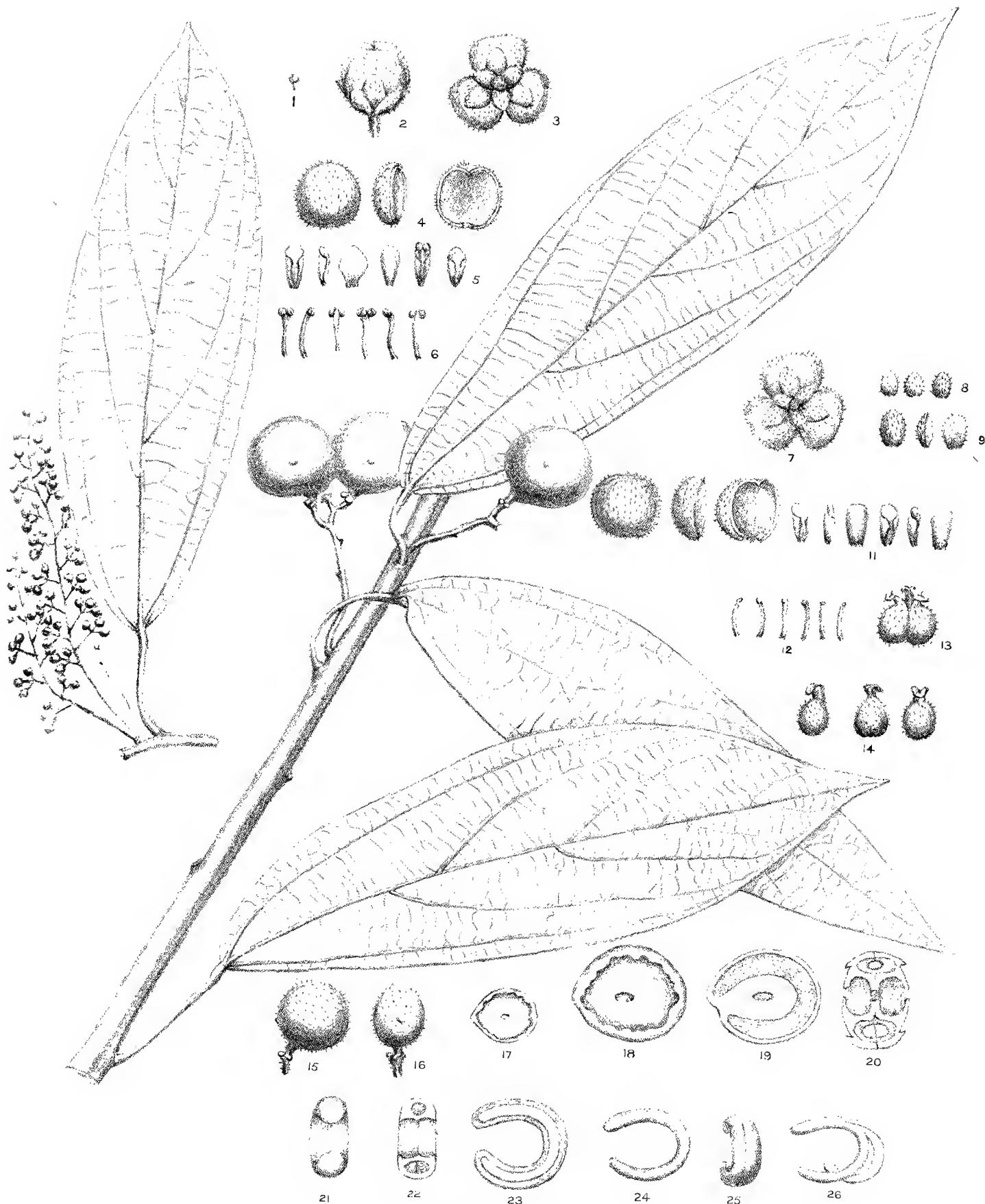


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*HYP SERPA CUSPIDATA.*



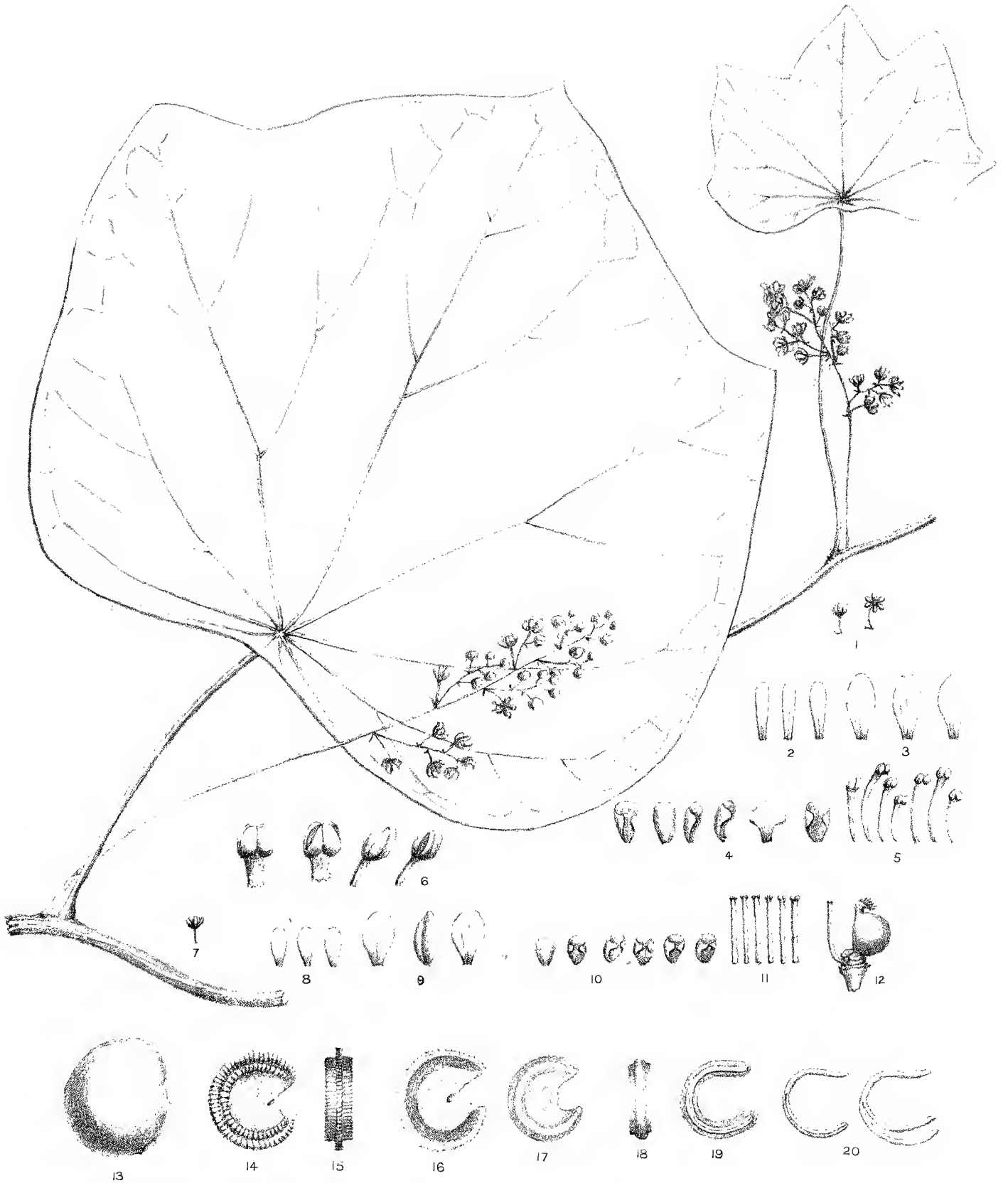




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LIMACIA DISTINCTA

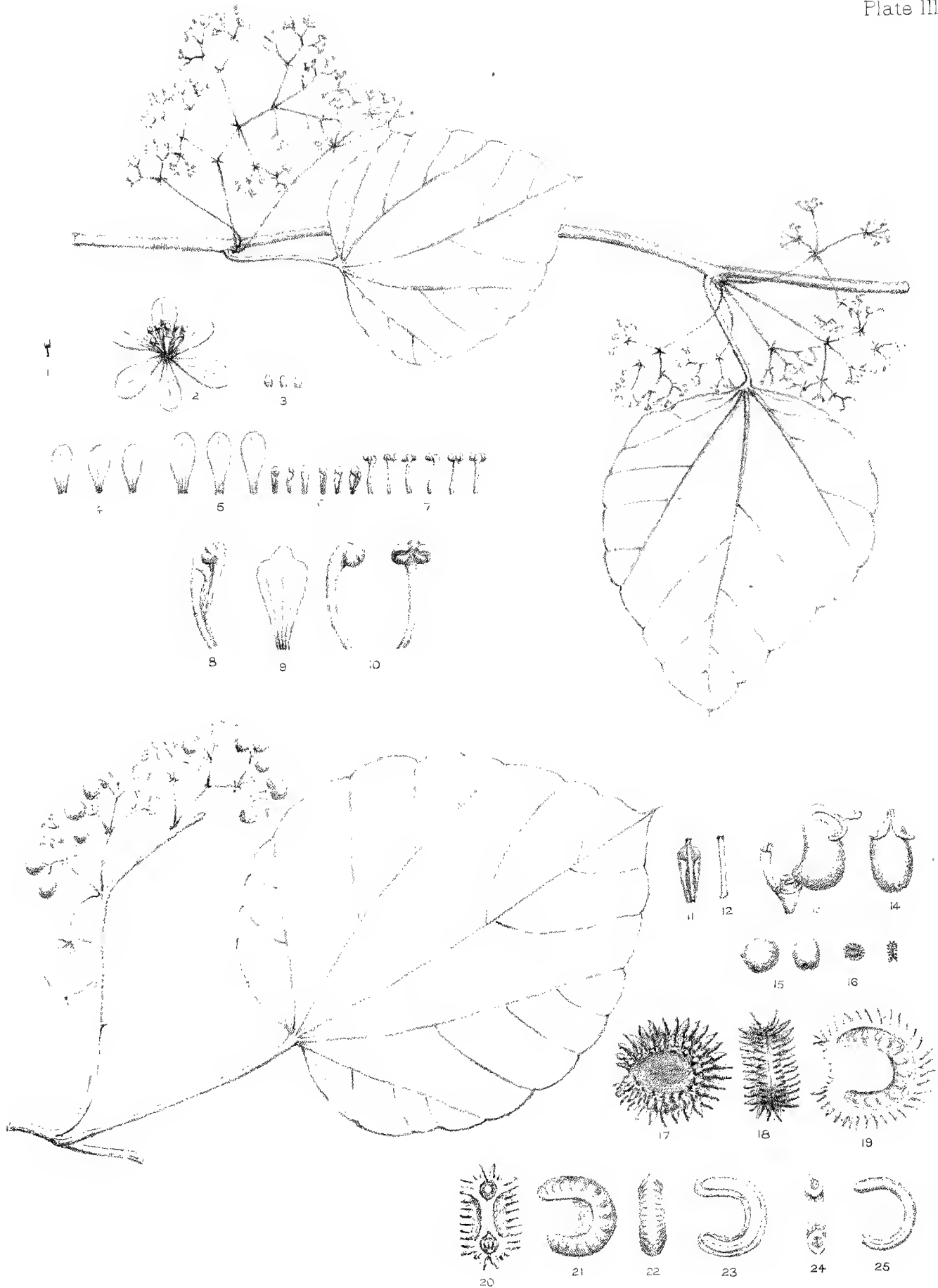




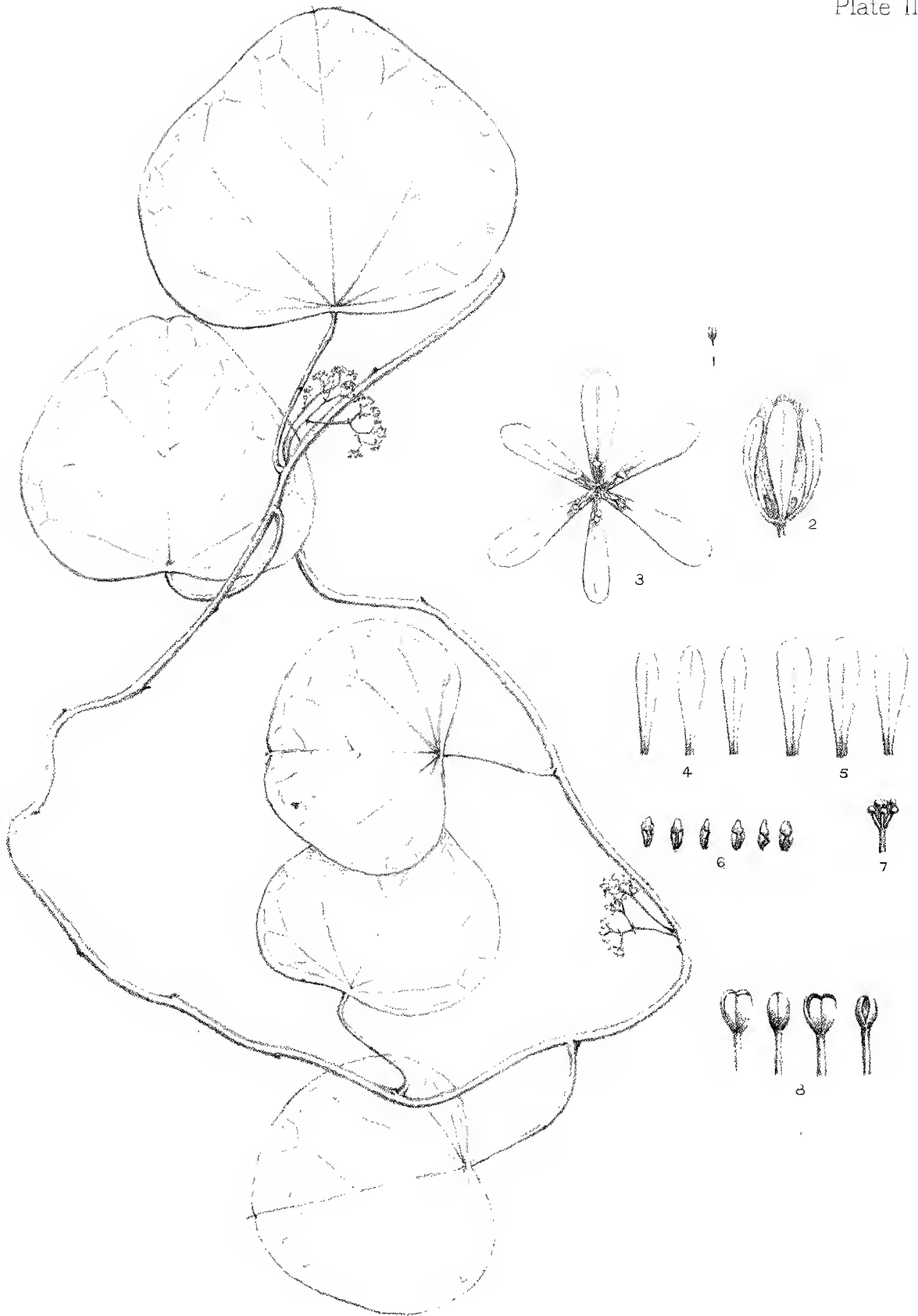
J. Miers del.

MENISPERMUM CANADENSE



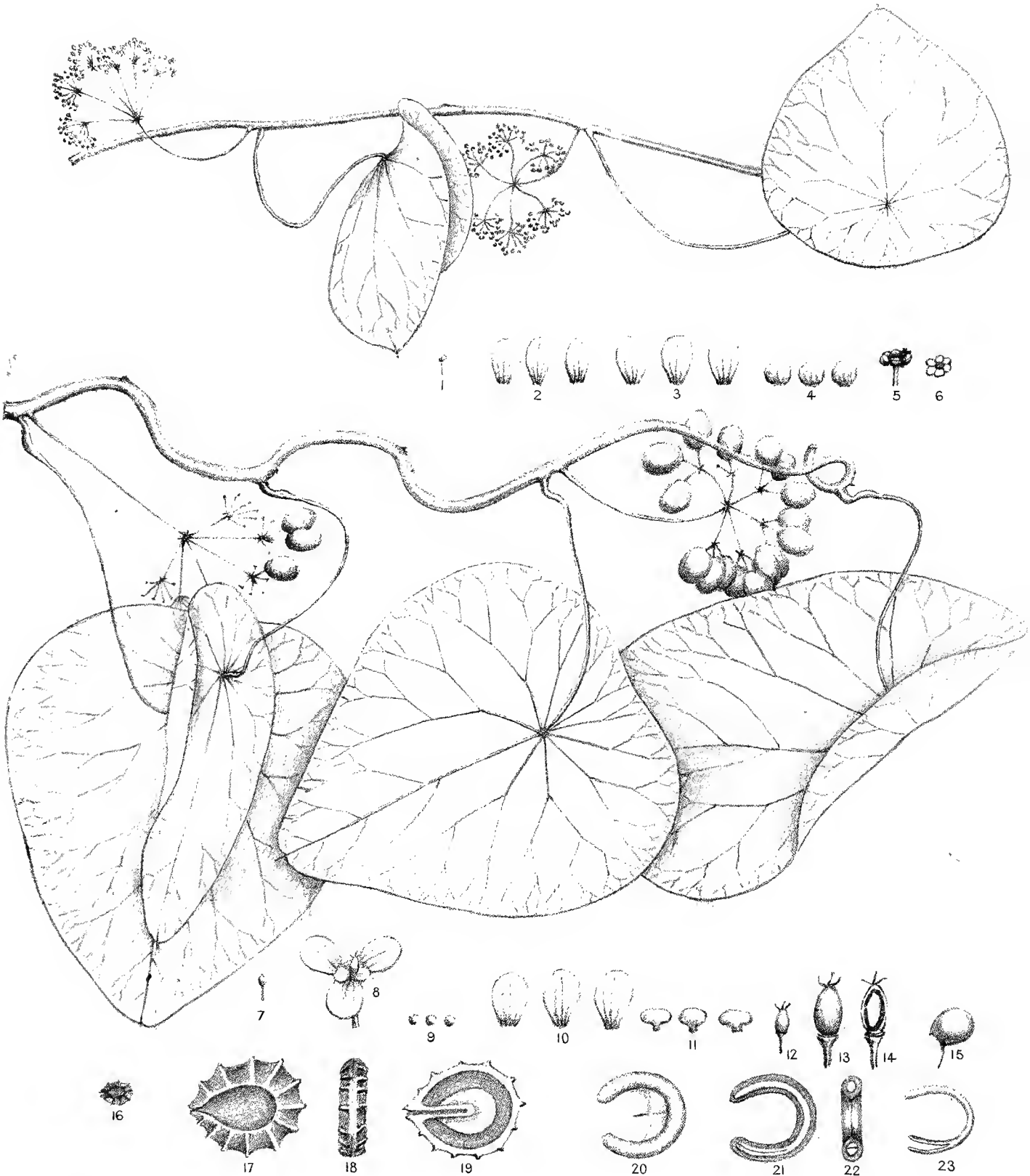








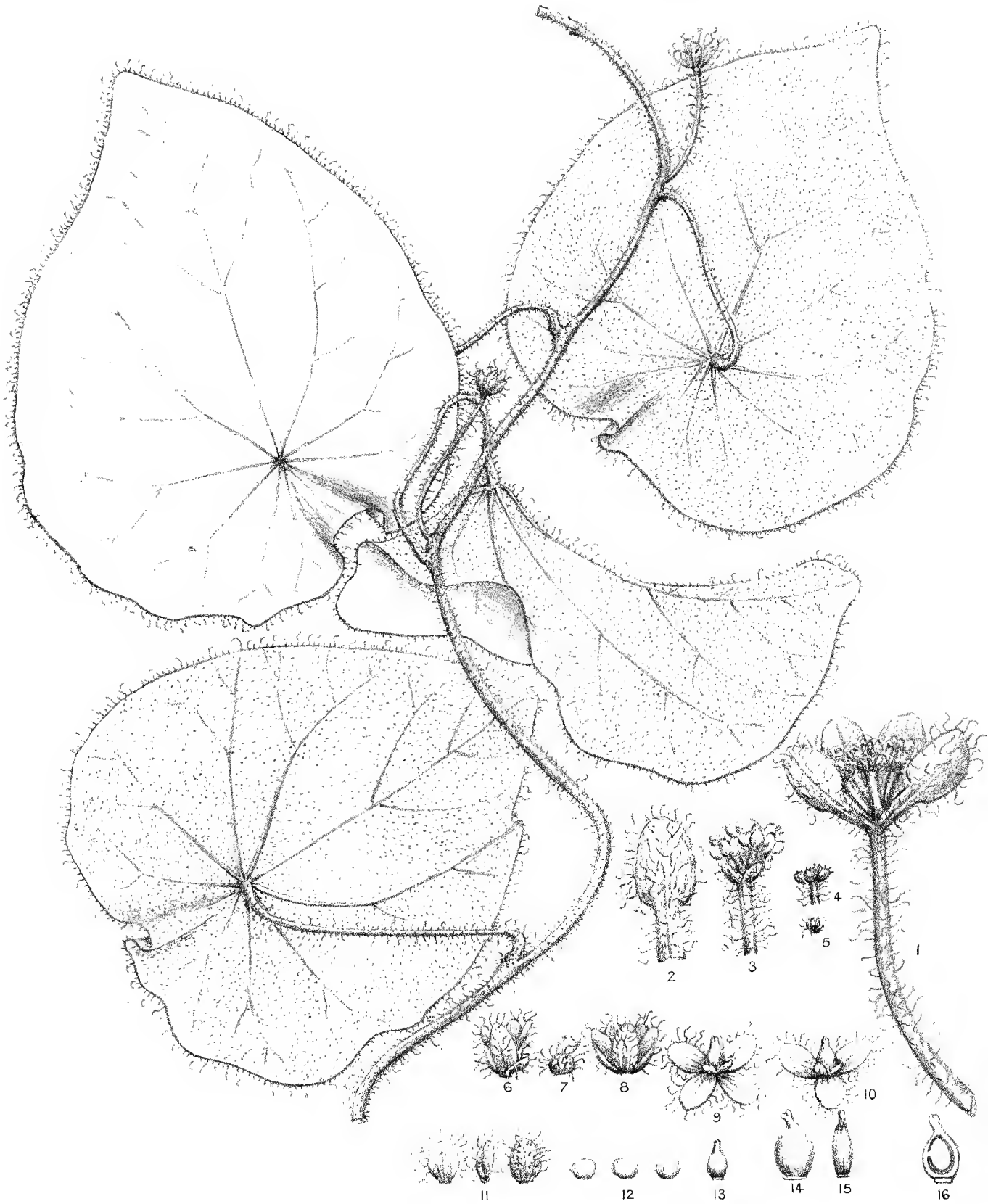




J. Miers del.

ILEOCARPUS SCHIMPERI

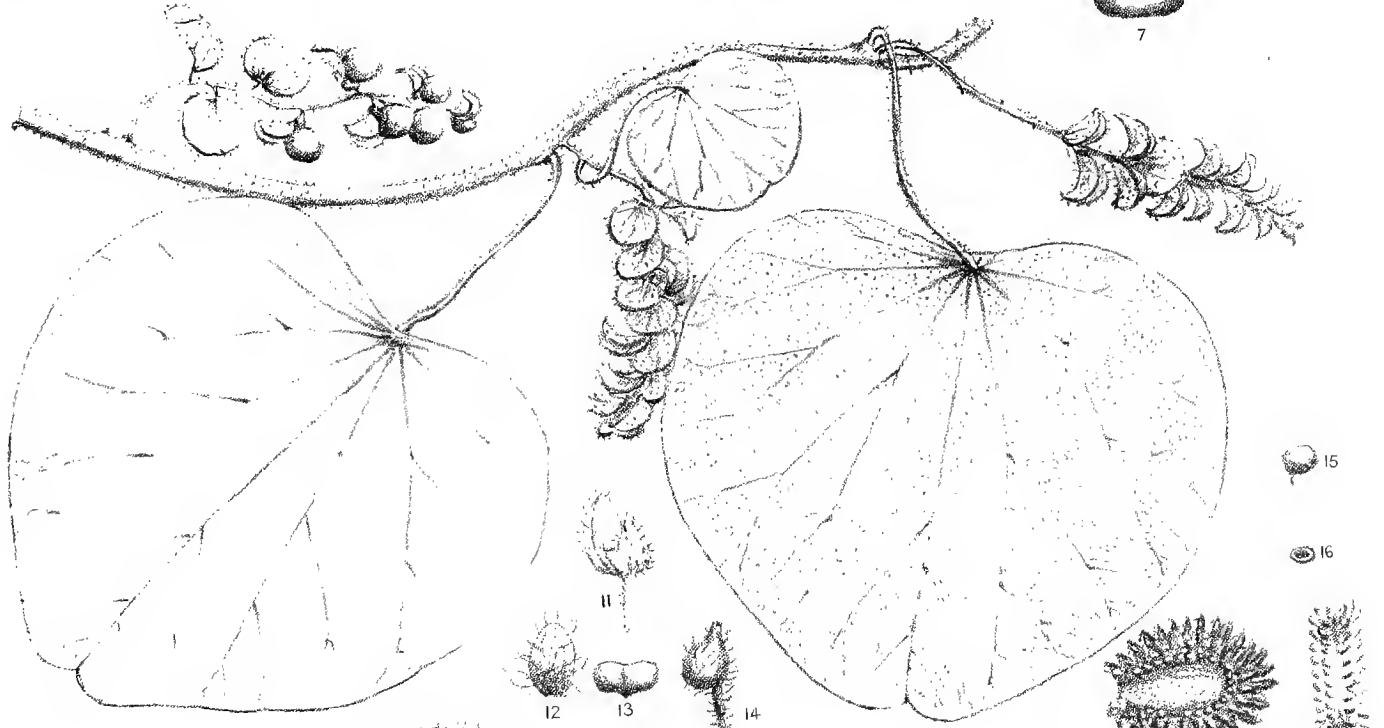
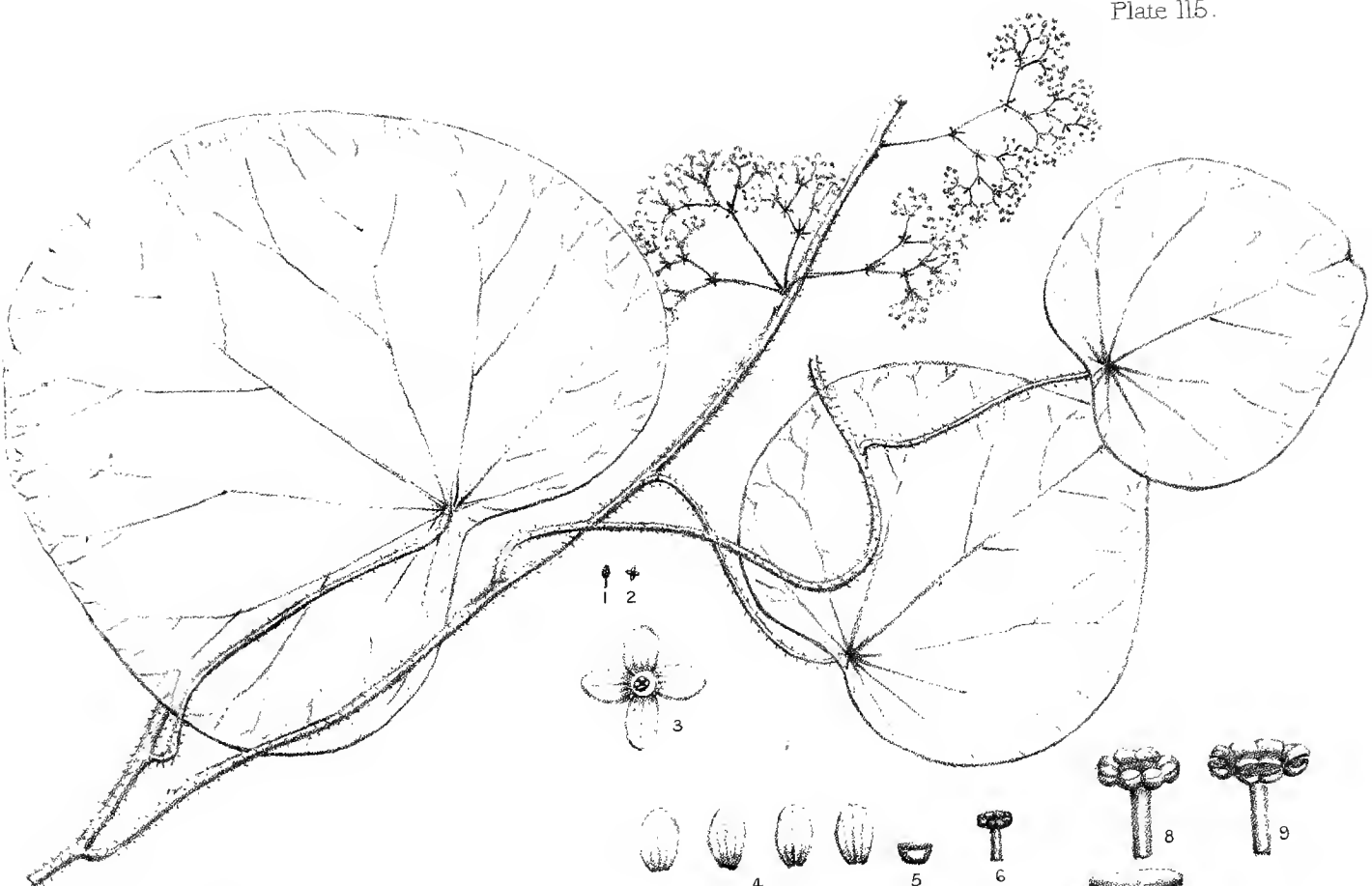




J. Miers del.

HOMOCNEMIA MEYERIANA.



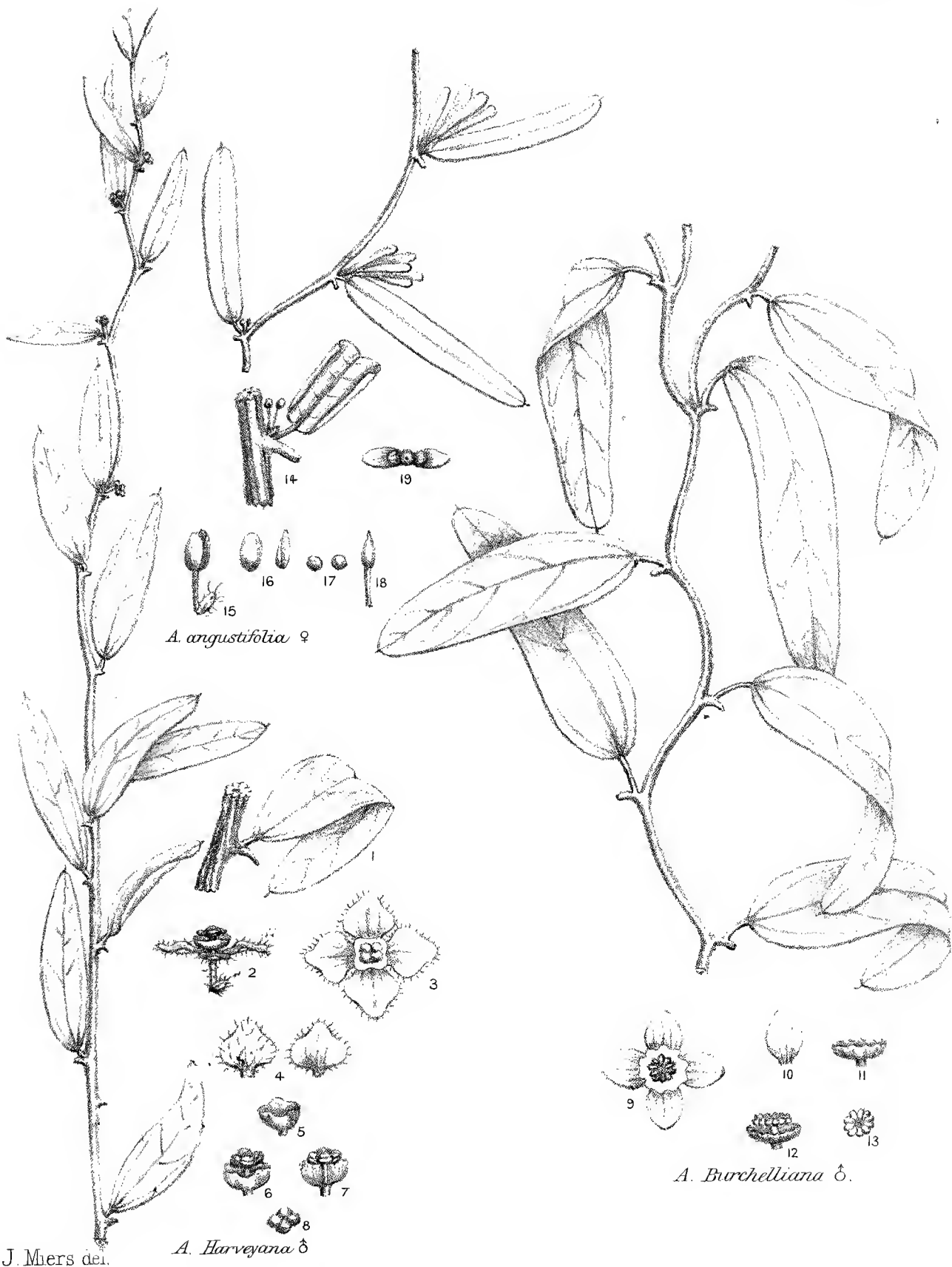


J. Miers. del.



CISSAMPELOS MICROCARPA.





*A. angustifolia* ♀

*A. Burchelliana* ♂

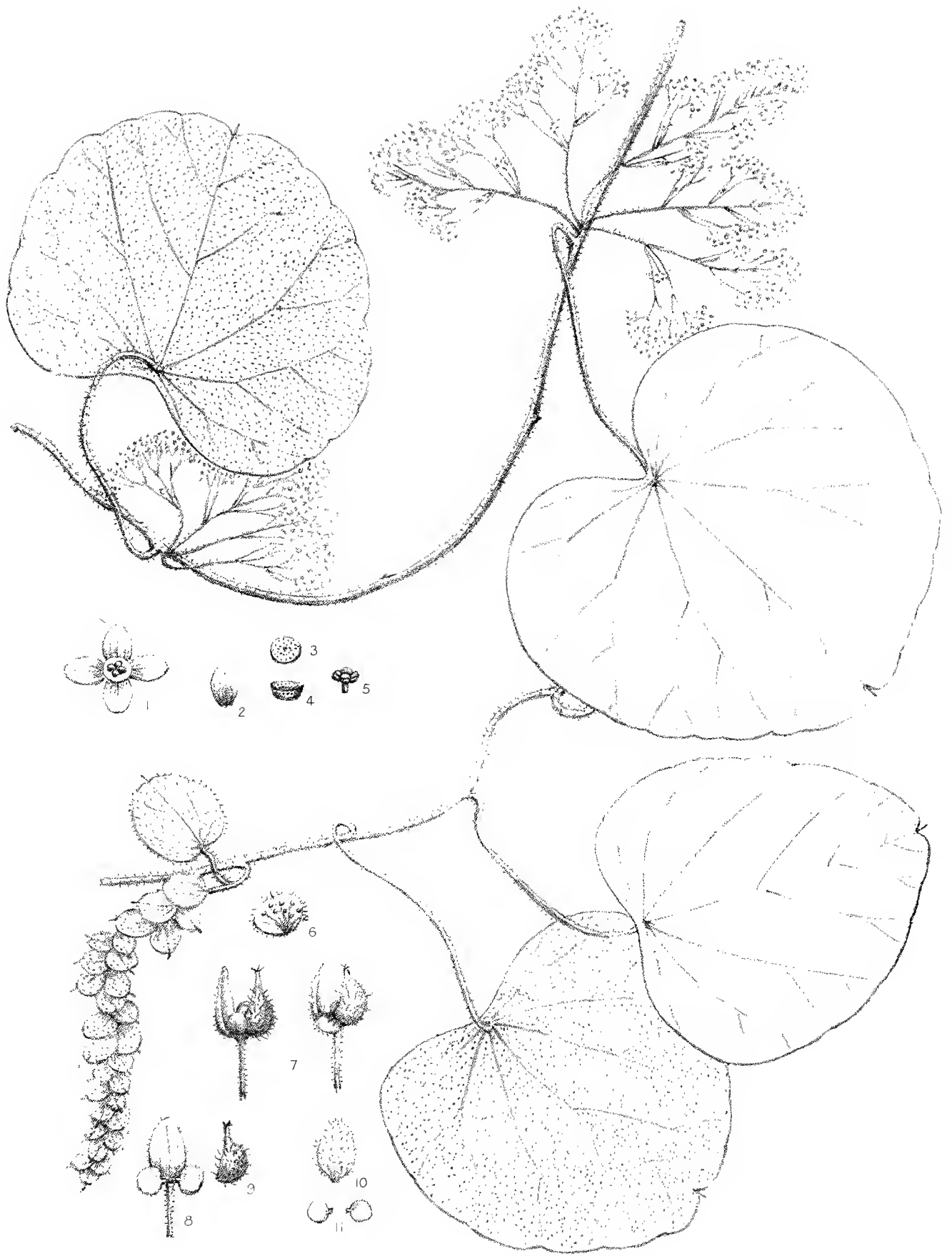
*A. Harveyana* ♂

J. Miers del.

ANTIZOMA.



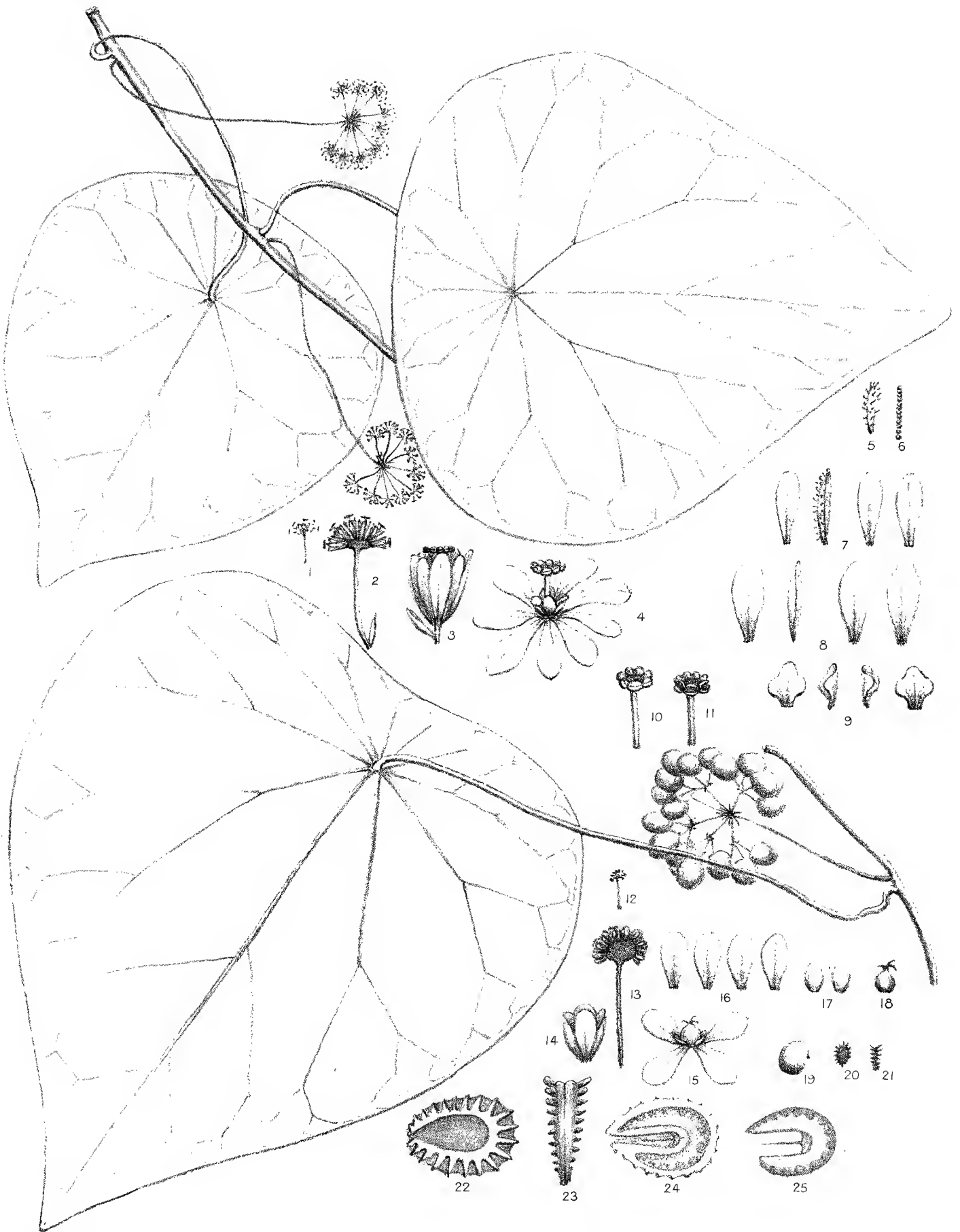




J. Miers, del

DISSOPETALUM MAURITIANUM

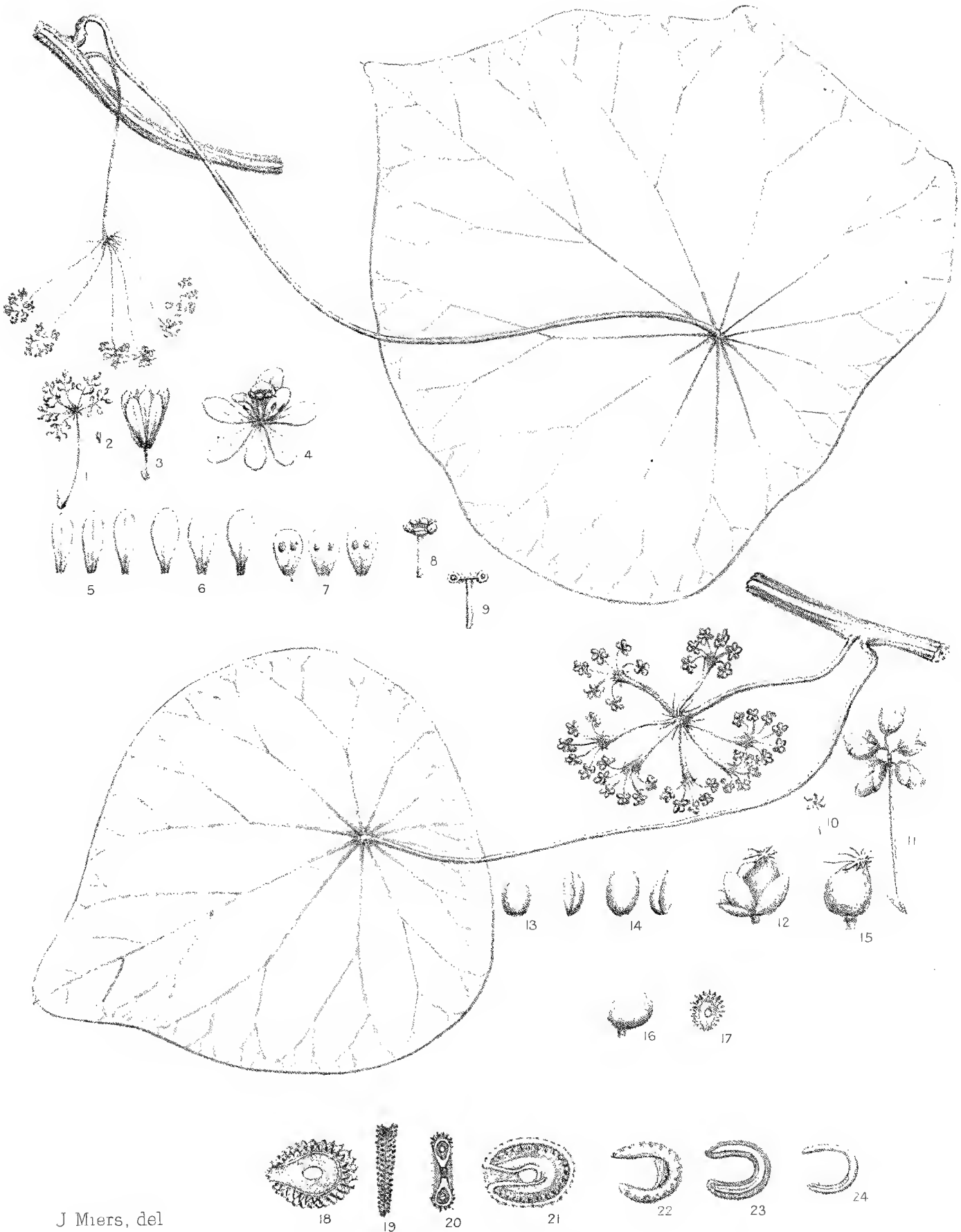




J. Miers, del.

CLYPEA FORSTERI

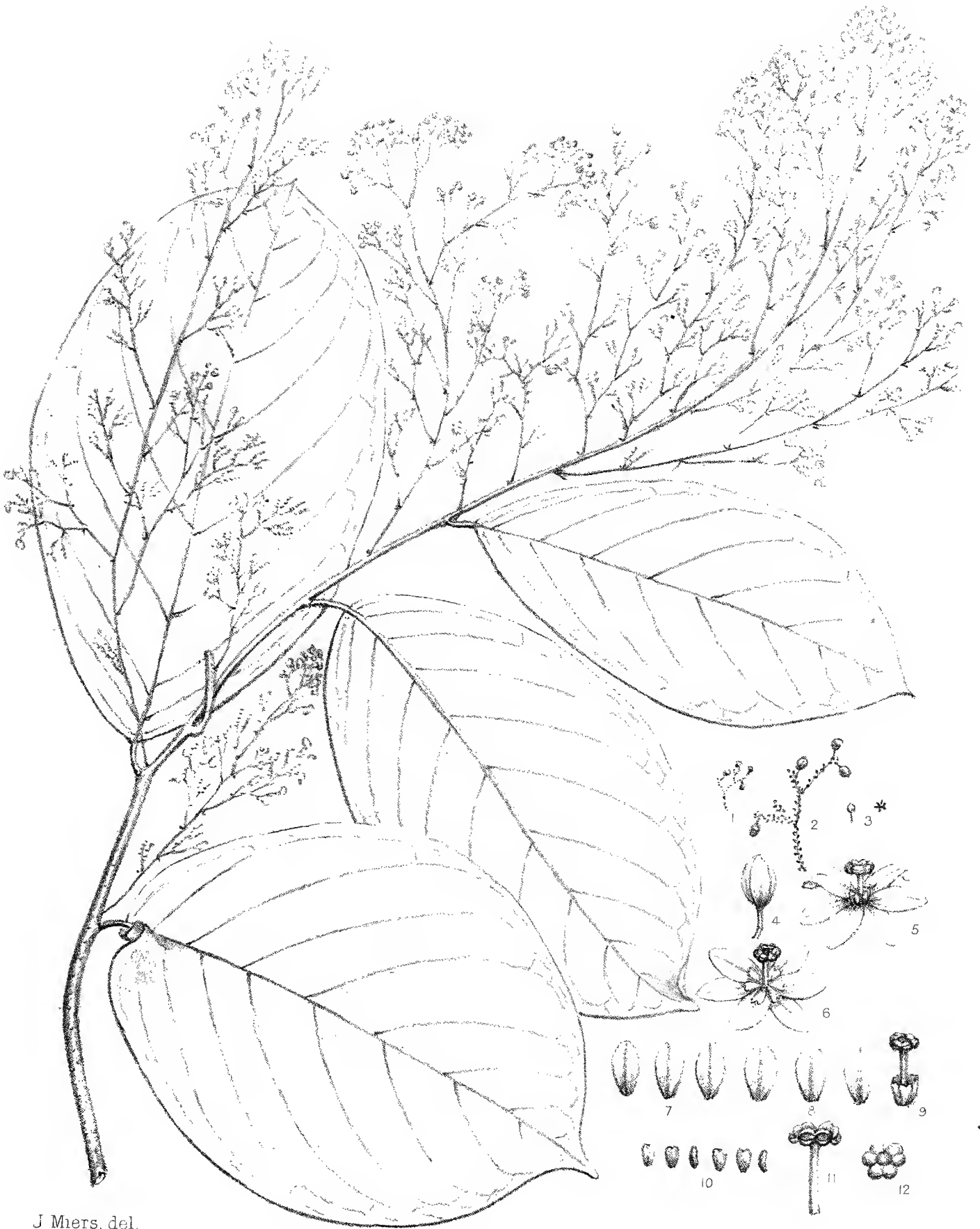




J Miers, del

STEPHANIA GLABRA





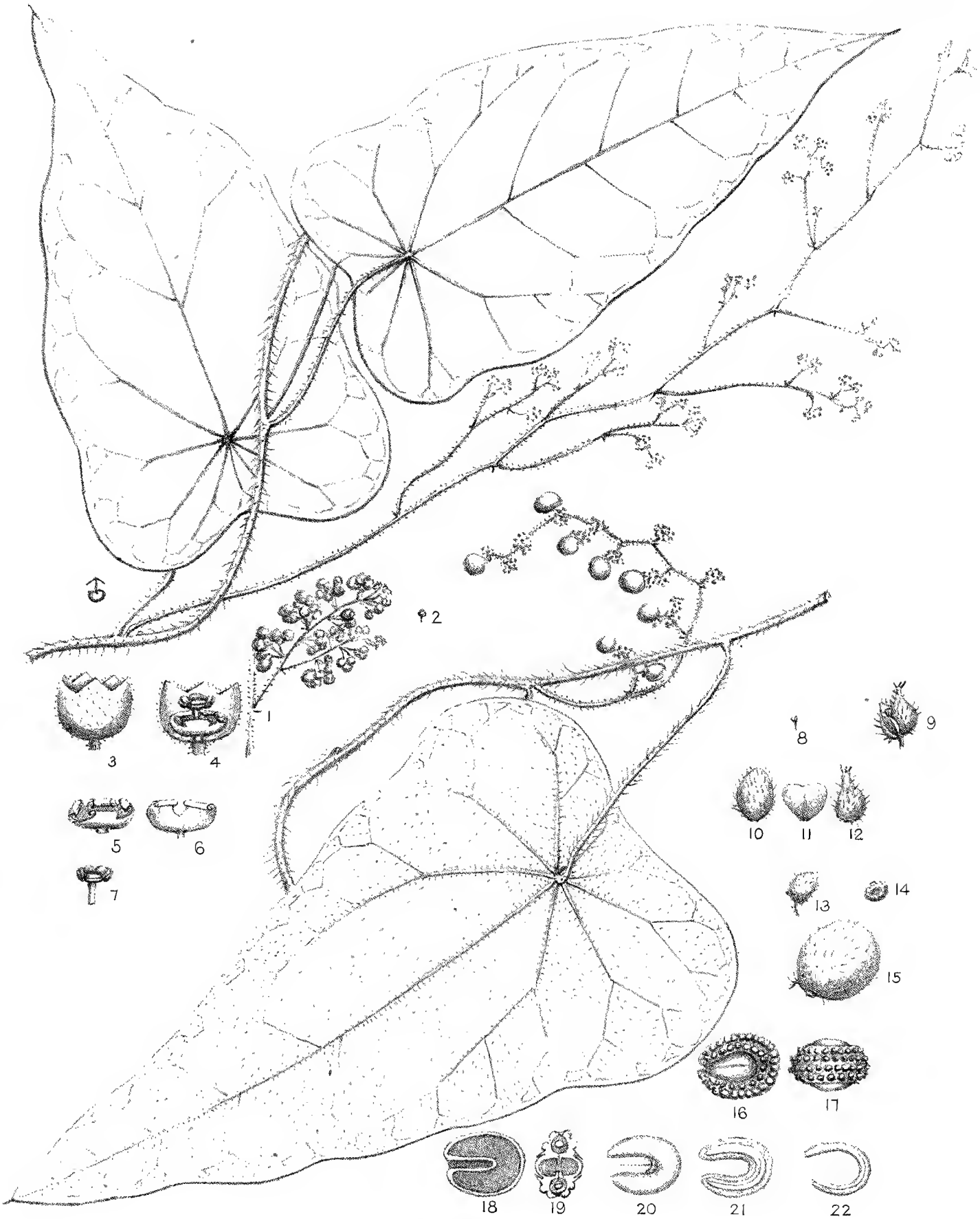
J Miers, del.

CLAMBUS ARANEOSUS

Madras, Madras & Macgregor. Lillies, the Queen's Garden, Near Agra, 1841. Proctor.





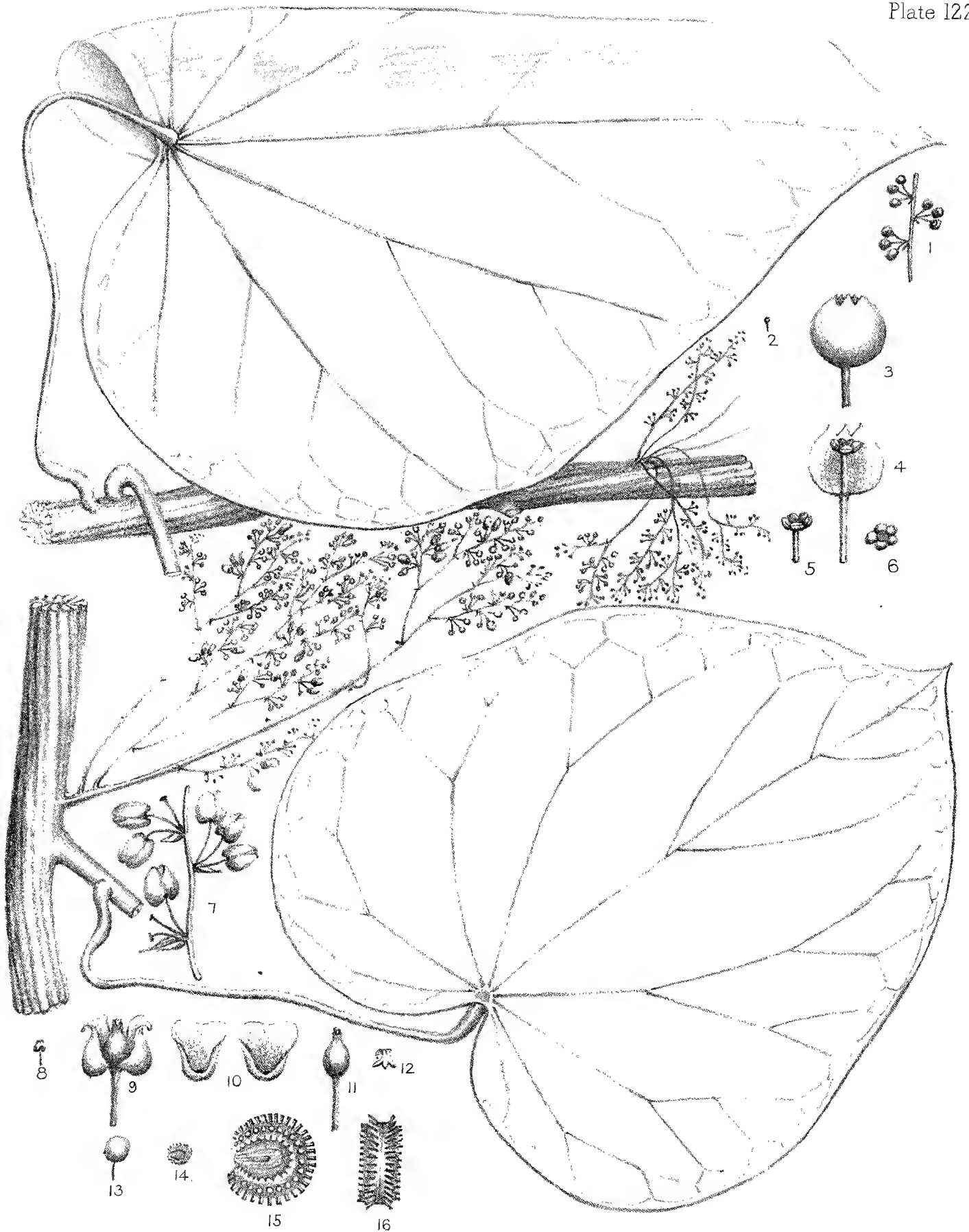


J. Miers del.

CYCLEA BURMANNI.

Mission: Harbord & Madsen for Edw. De Caux, London, New Synoptic System.

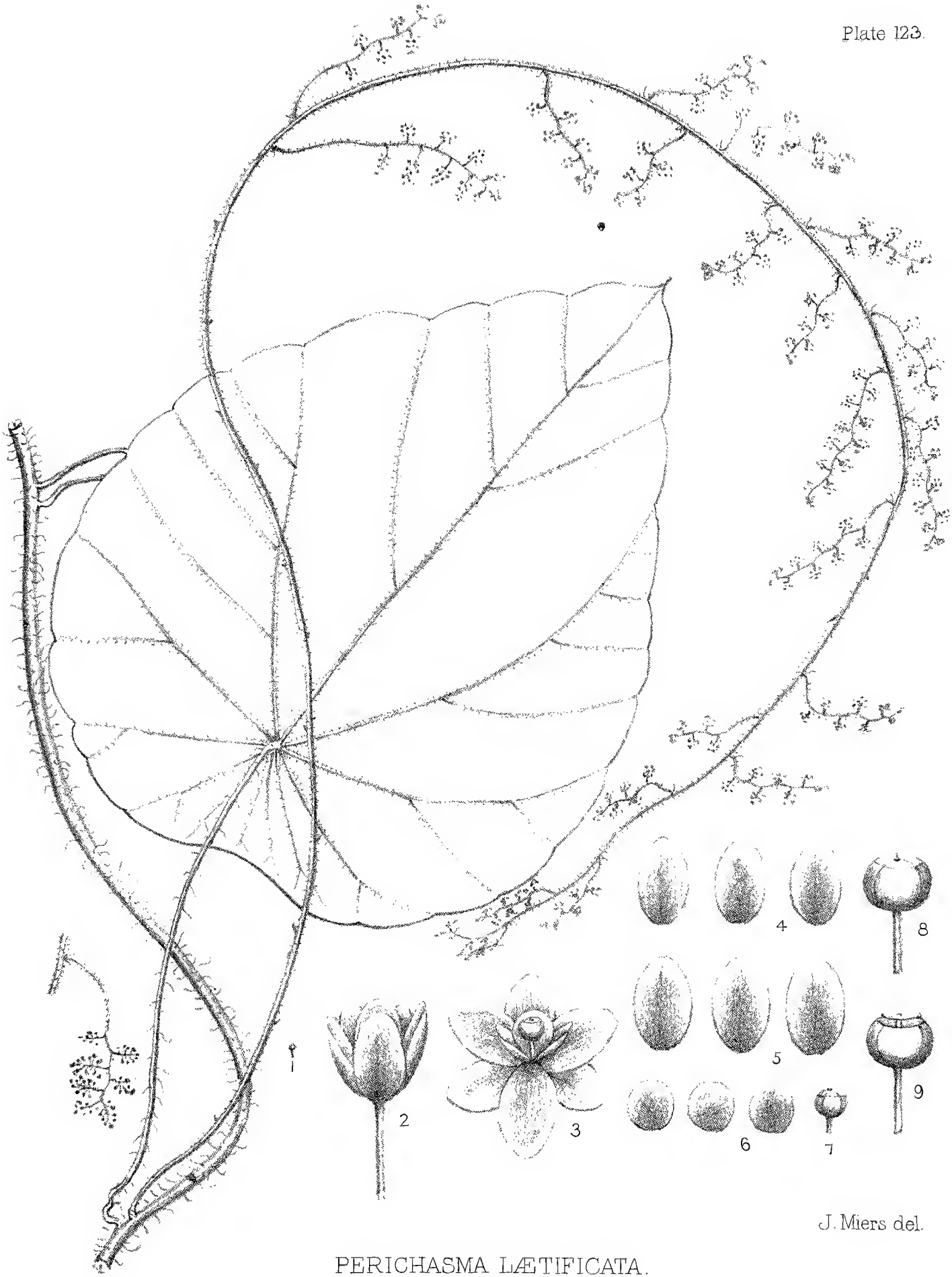




J. Miers del.

PERAPHORA ROBUSTA.

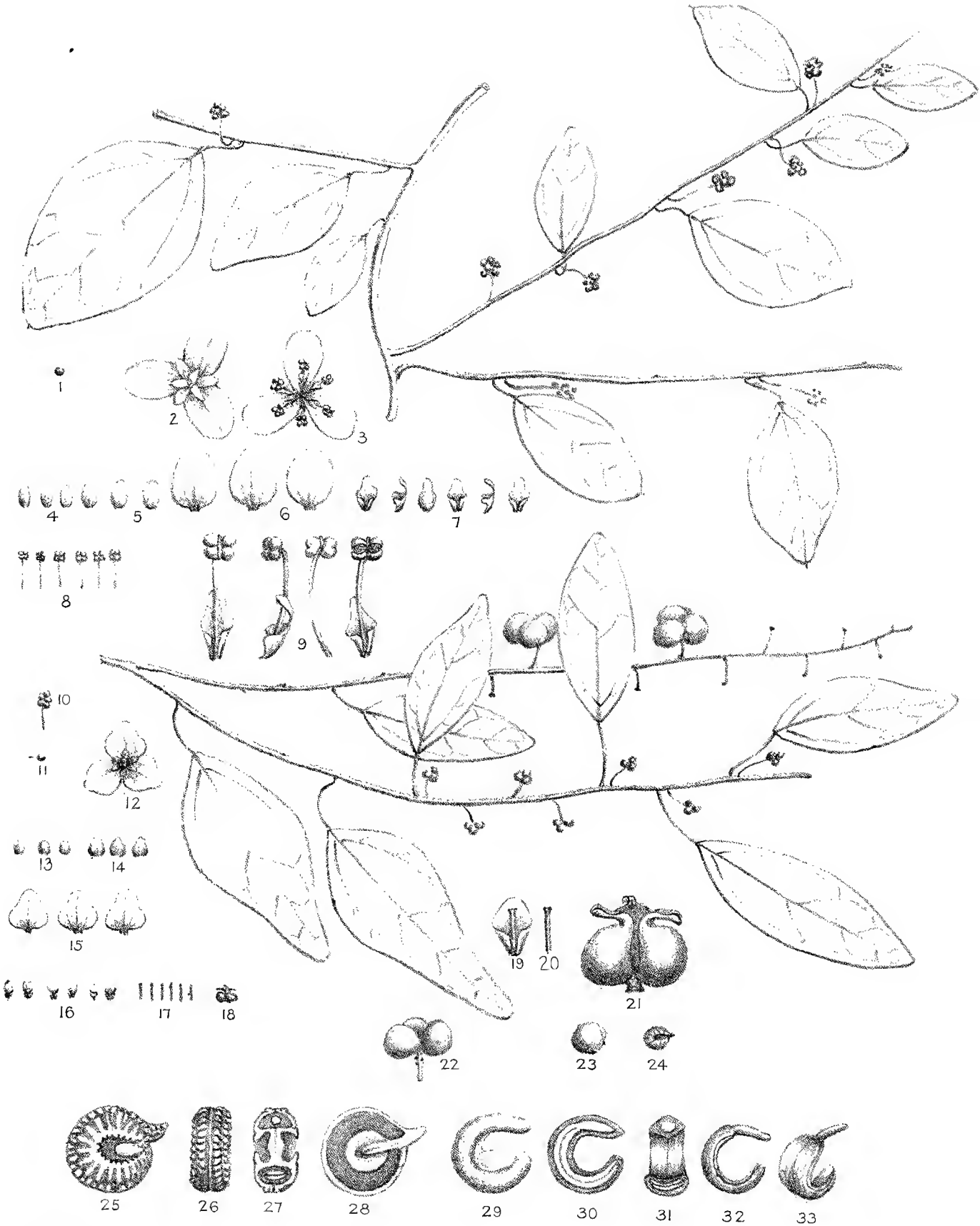




J. Miers del.

PERICHASMA LÆTIFICATA.



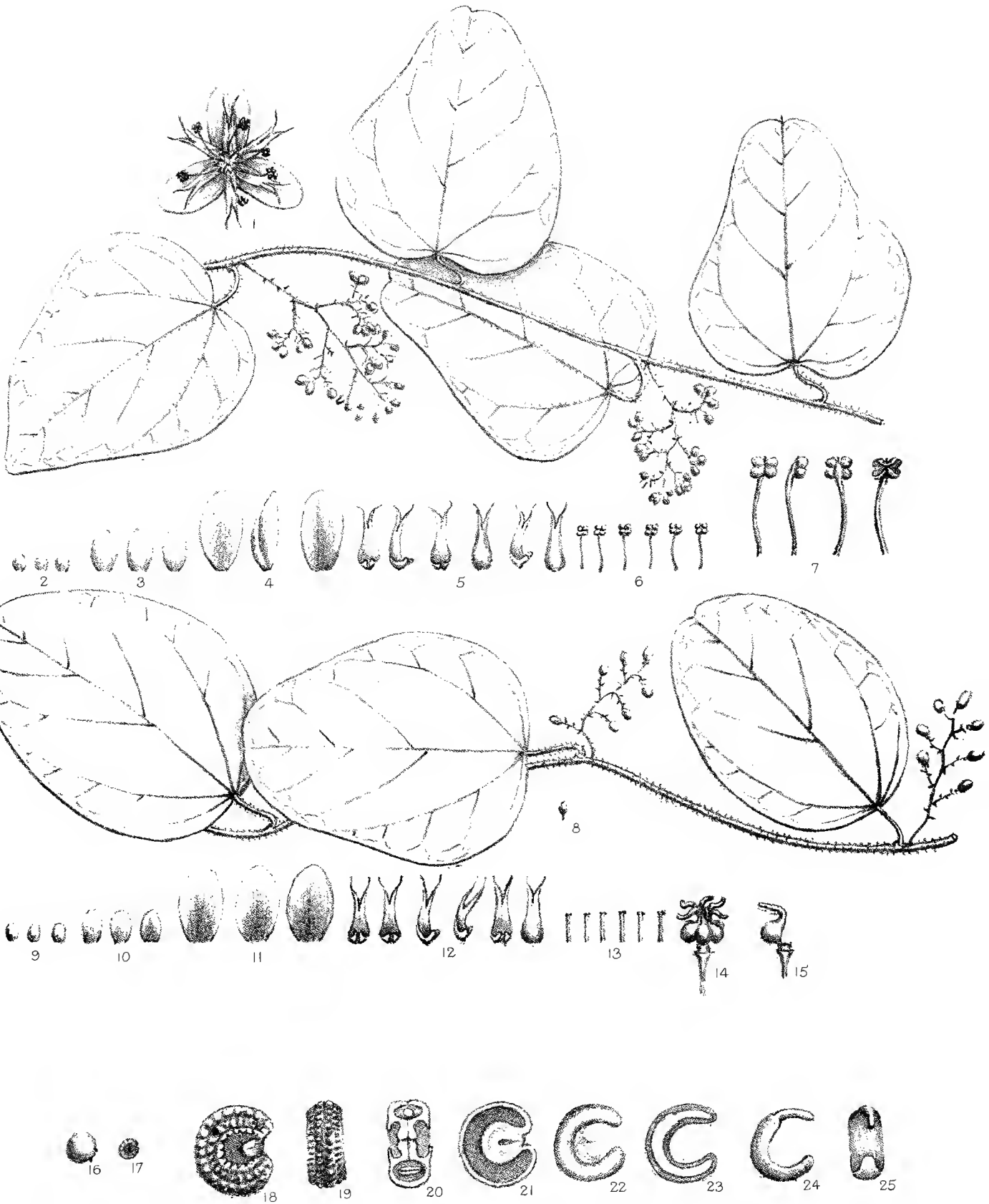


J. Miers del.

*COCCULUS GLABER.*



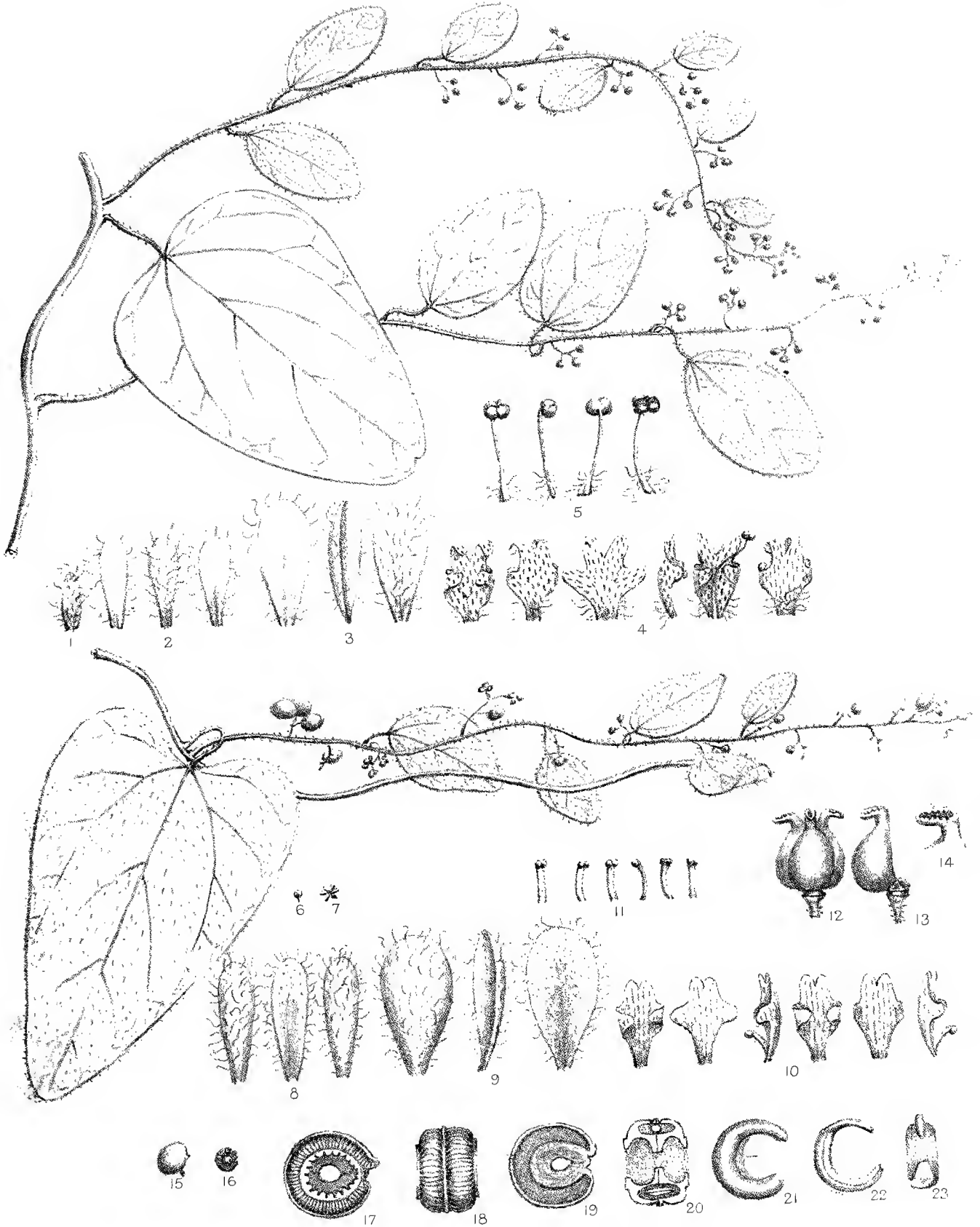




J Miers, del.

NEPHROICA HEXAGYNA

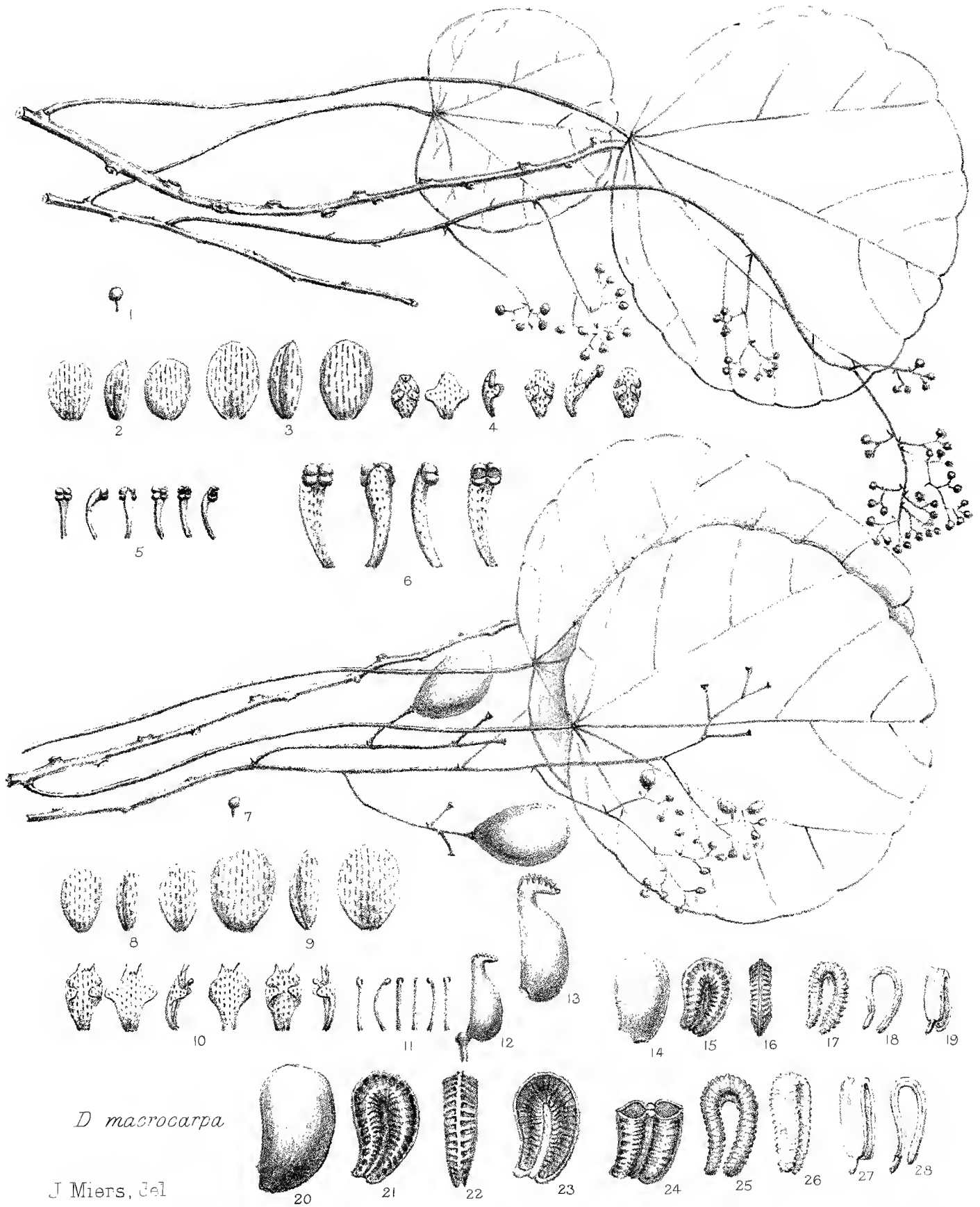




J. Miers, del

HOLOPEIRA VILLOSA



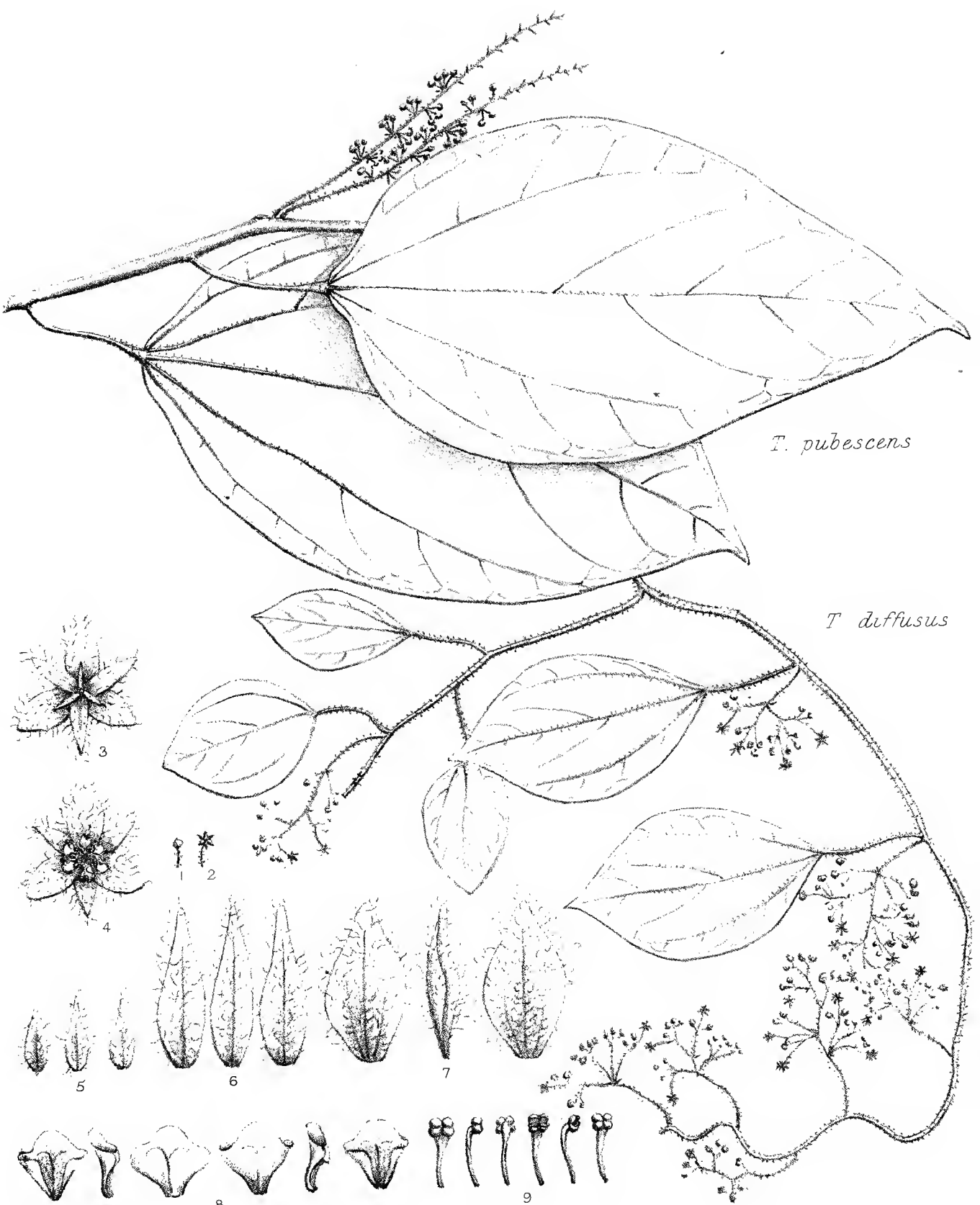


*D macrocarpa*

J Miers, del

DIPLOCLISIA INCLYTA





*T. pubescens*

*T. diffusus*

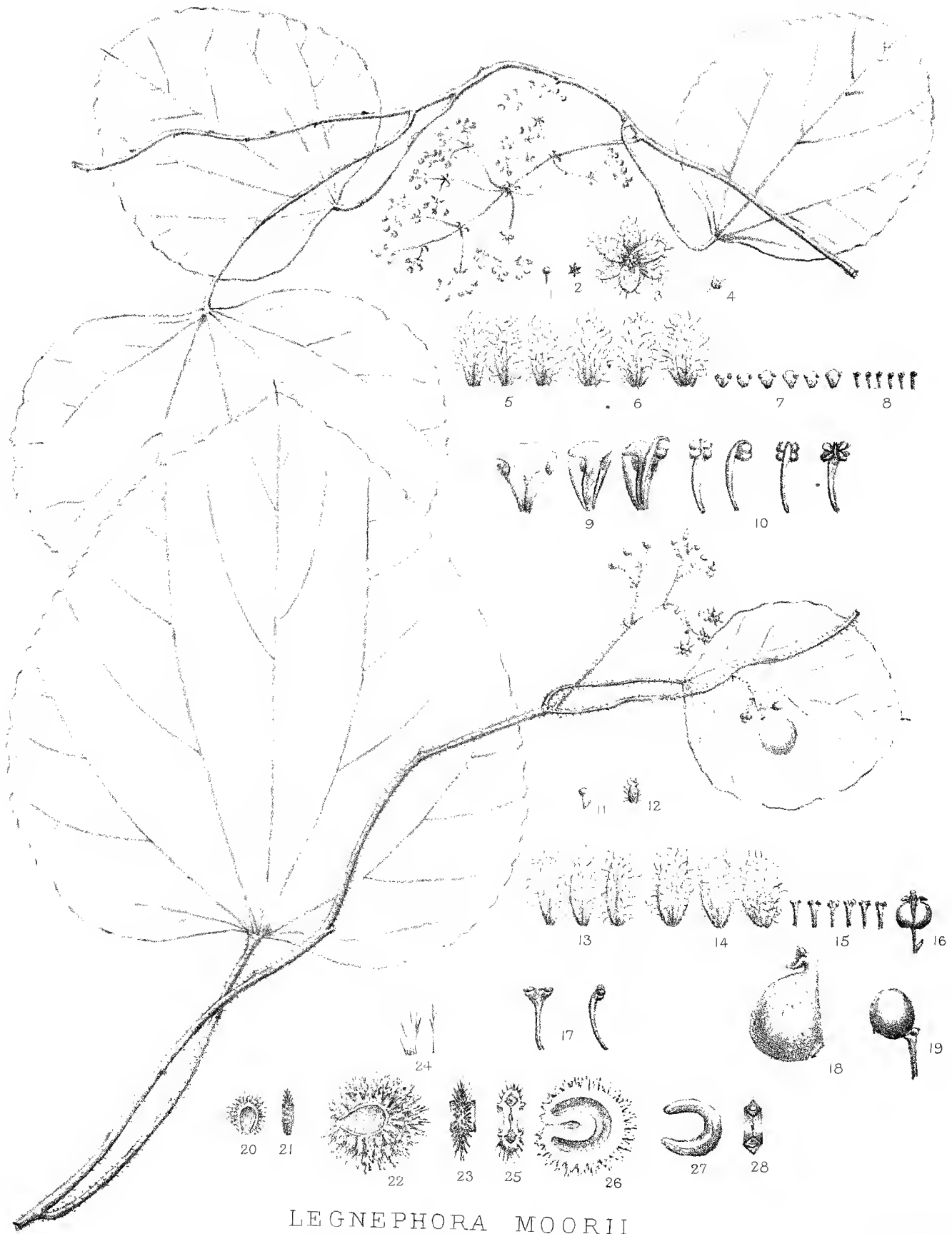
J. Miers, del.

TRISTICHOCALYX

Walter Mackenzie & Company, Ltd. 10, Queen Street, Glasgow



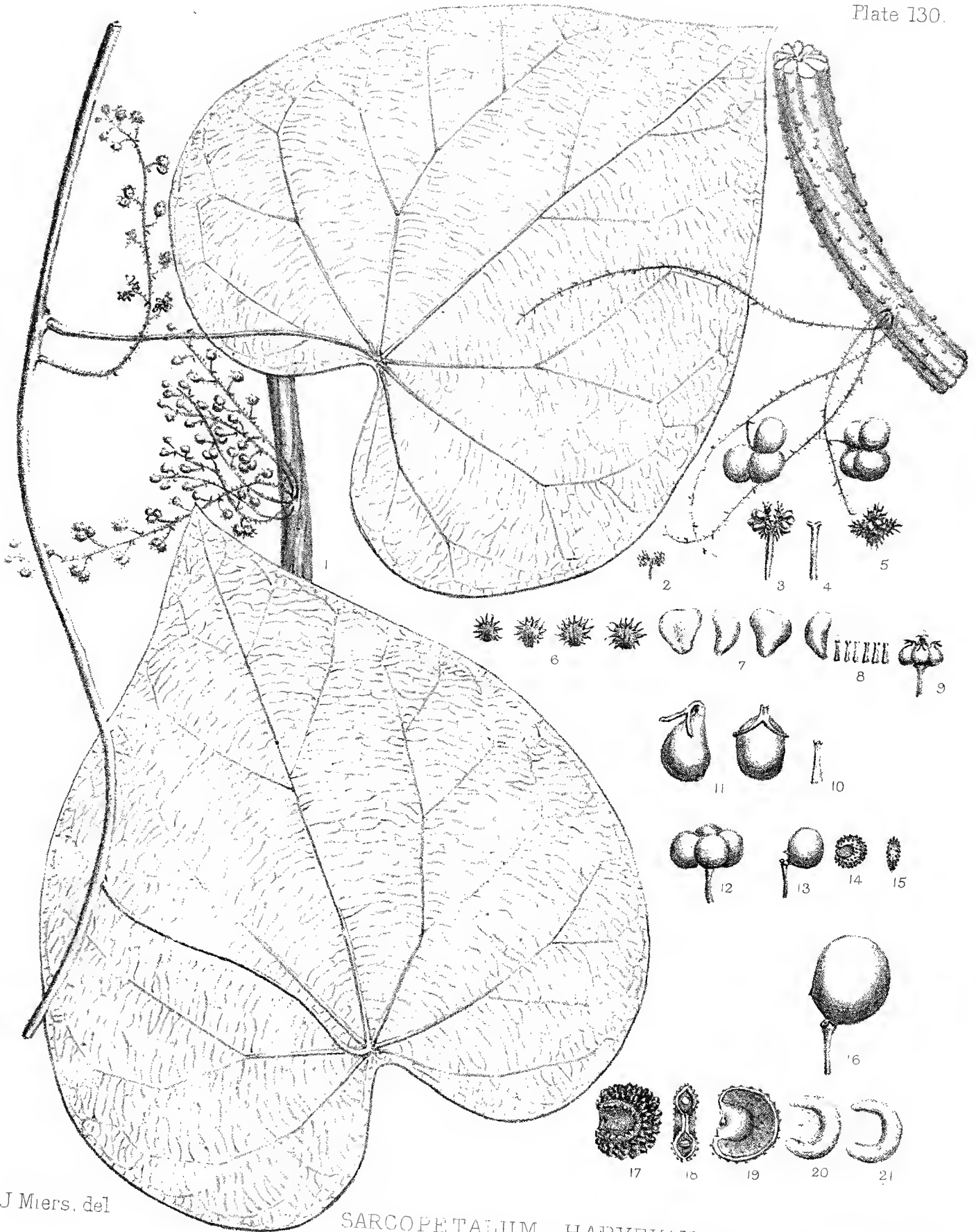




LEGNEPHORA MOORII

J. Miers, del.



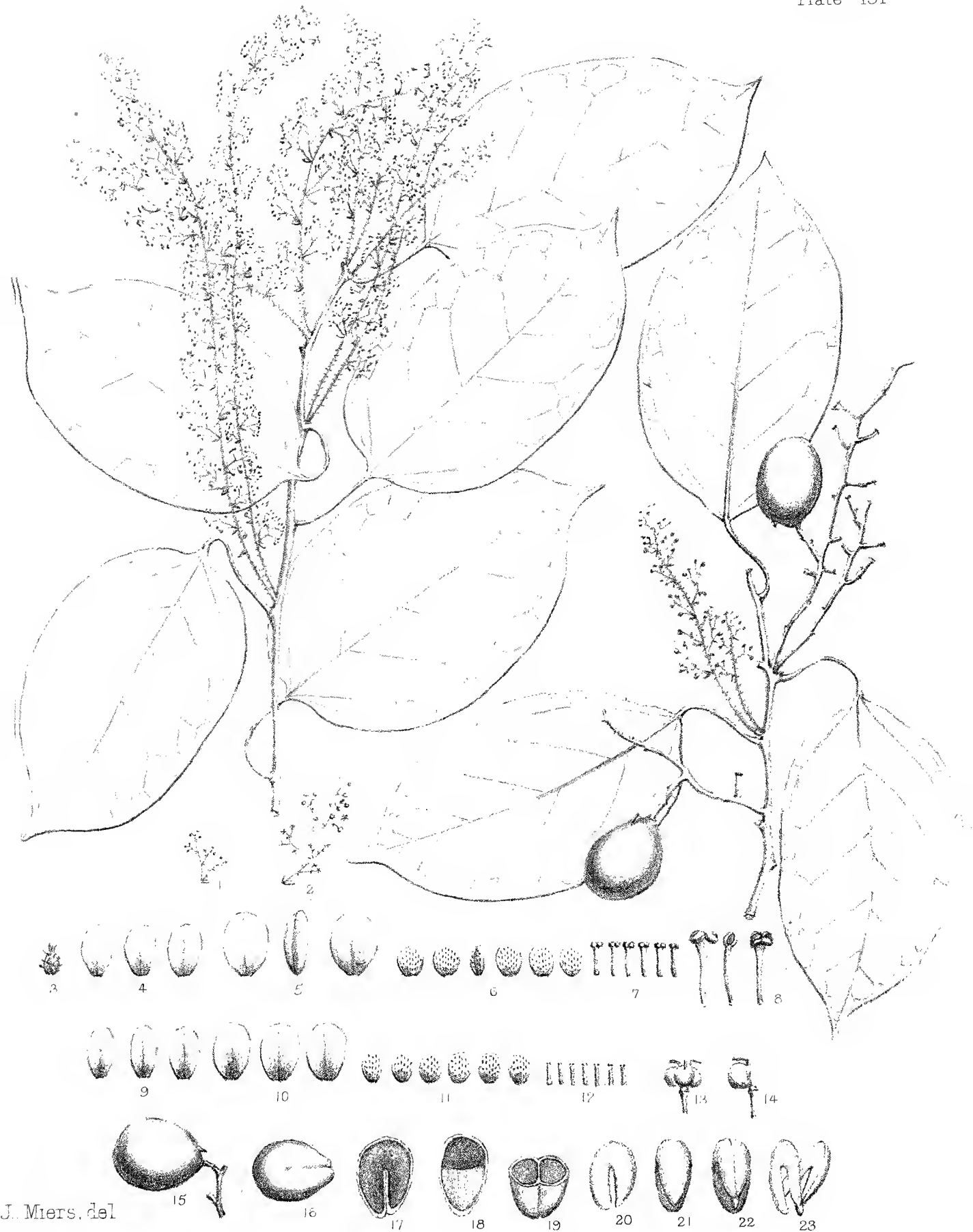


J Miers. del

SARCOPEETIUM HARVEYANUM

Mans. Nach. Bild & Marzinger Lith. - de Oorn 1-14. G. View Autograv. Inves.

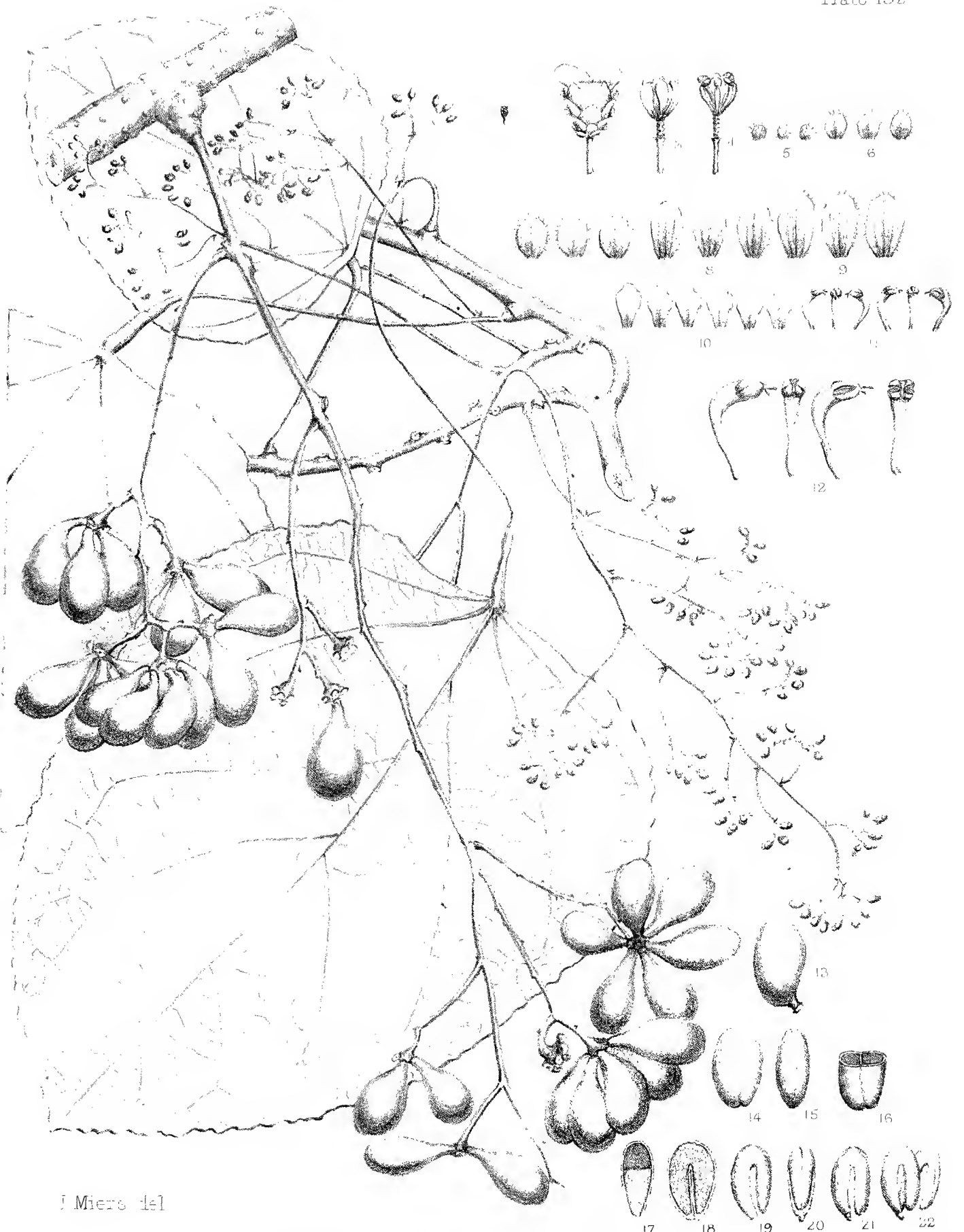




J. Miers. del

HYPERBAENA DOMINGENSIS



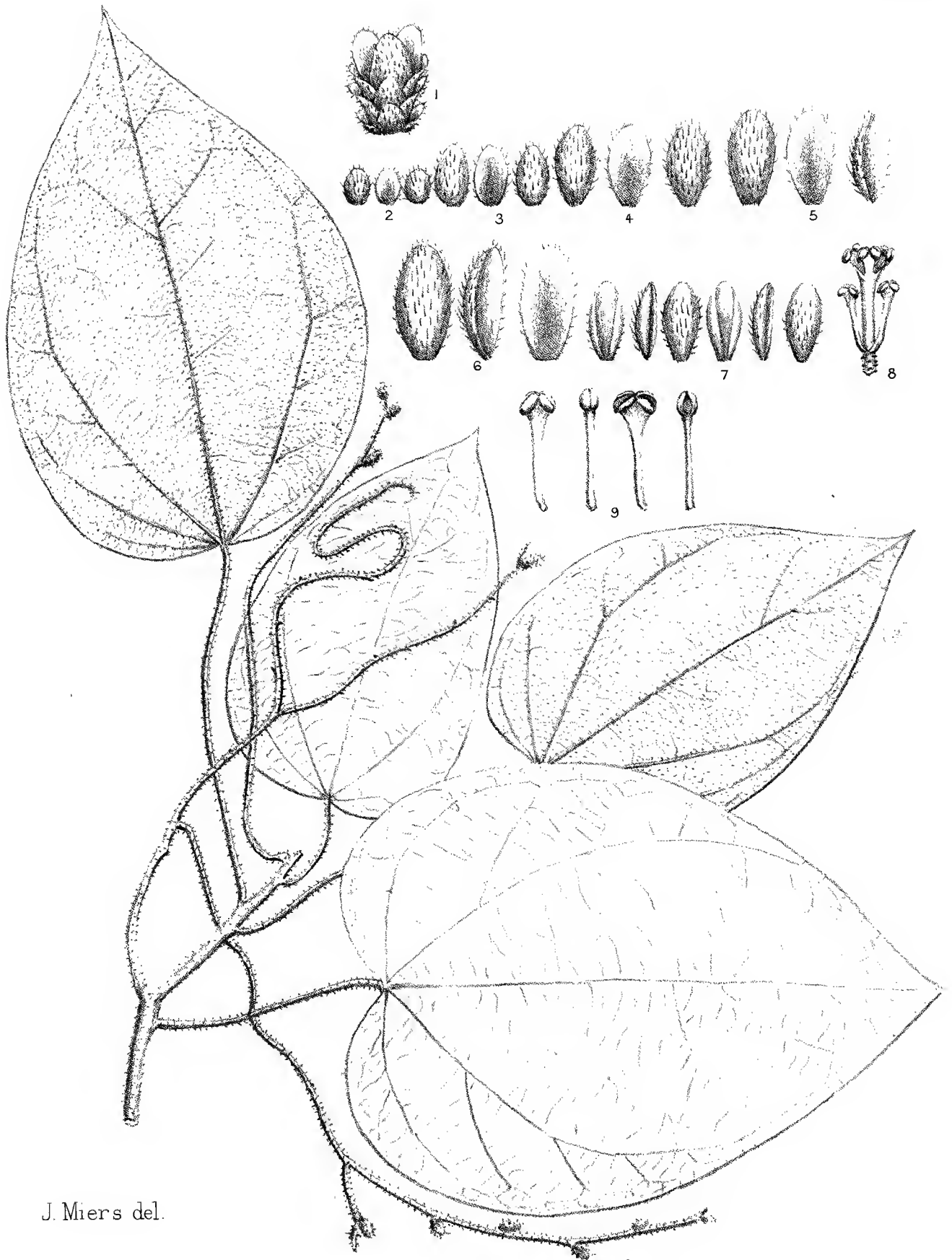


J. Miers del.

CHONDRODENDRUM OBSCURUM







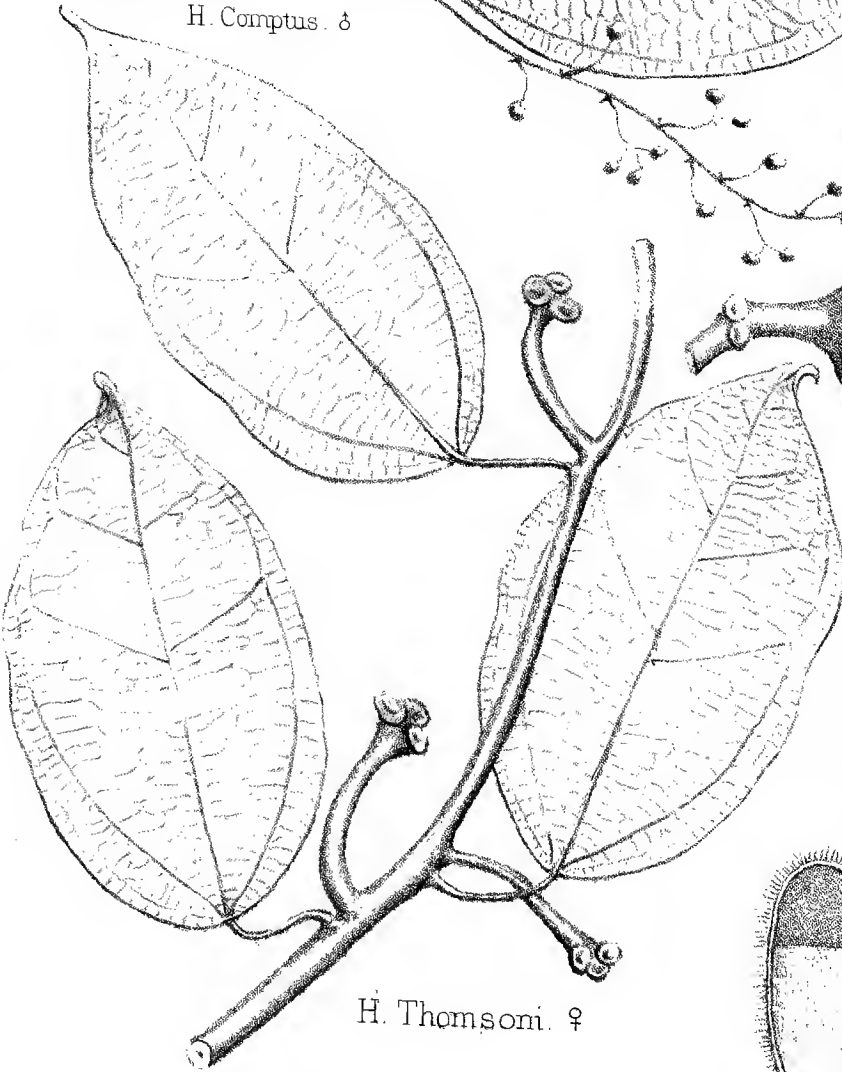
J. Miers del.

SYCHNOSEPALUM SAGOTIANUM.

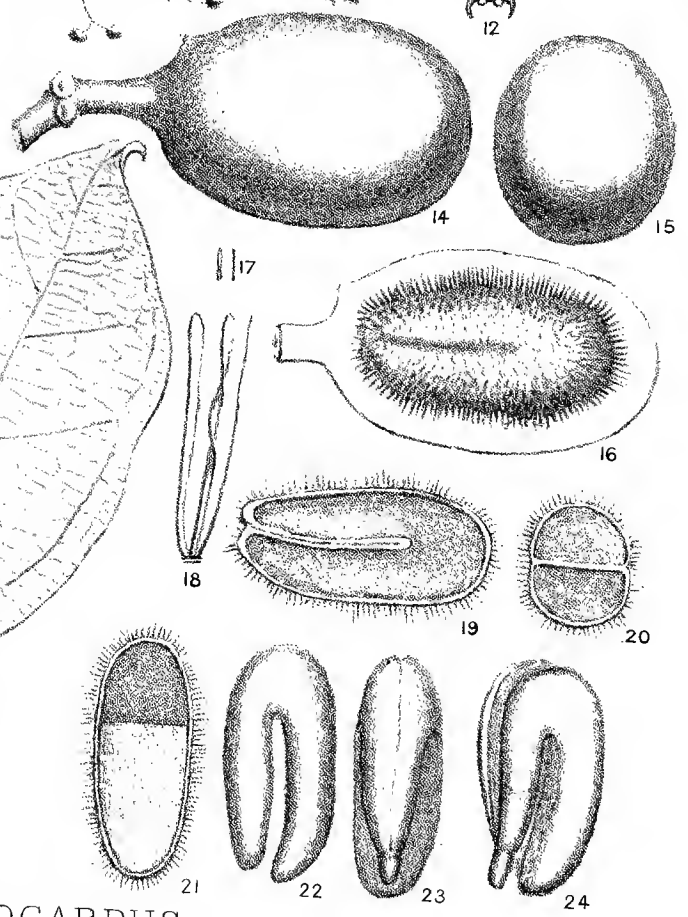




*H. Comptus*. ♂



*H. Thomsoni*. ♀



J. Miers del.

HÆMATOCARPUS

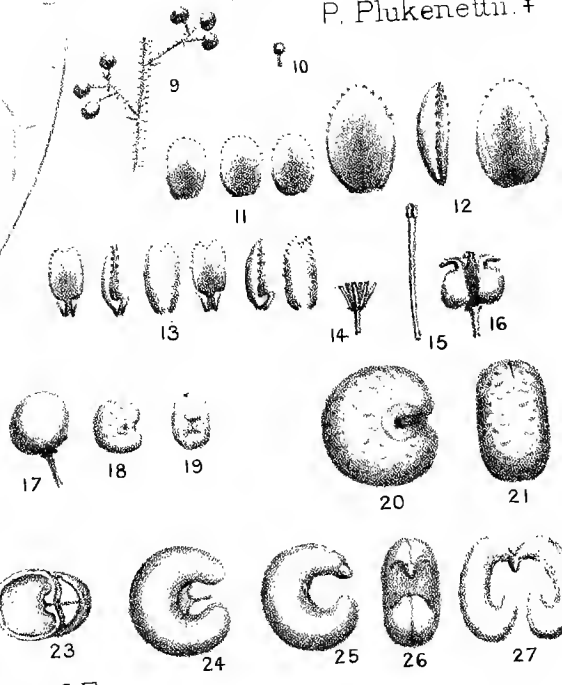
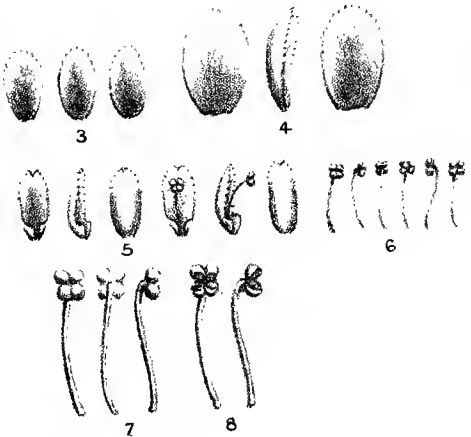
Madras Mus. 12-25. Miers del. L.S. & Co. Ovens, London. No. 10, St. Mark's St.





P Ovata ♂

P. Plukenettii ♀

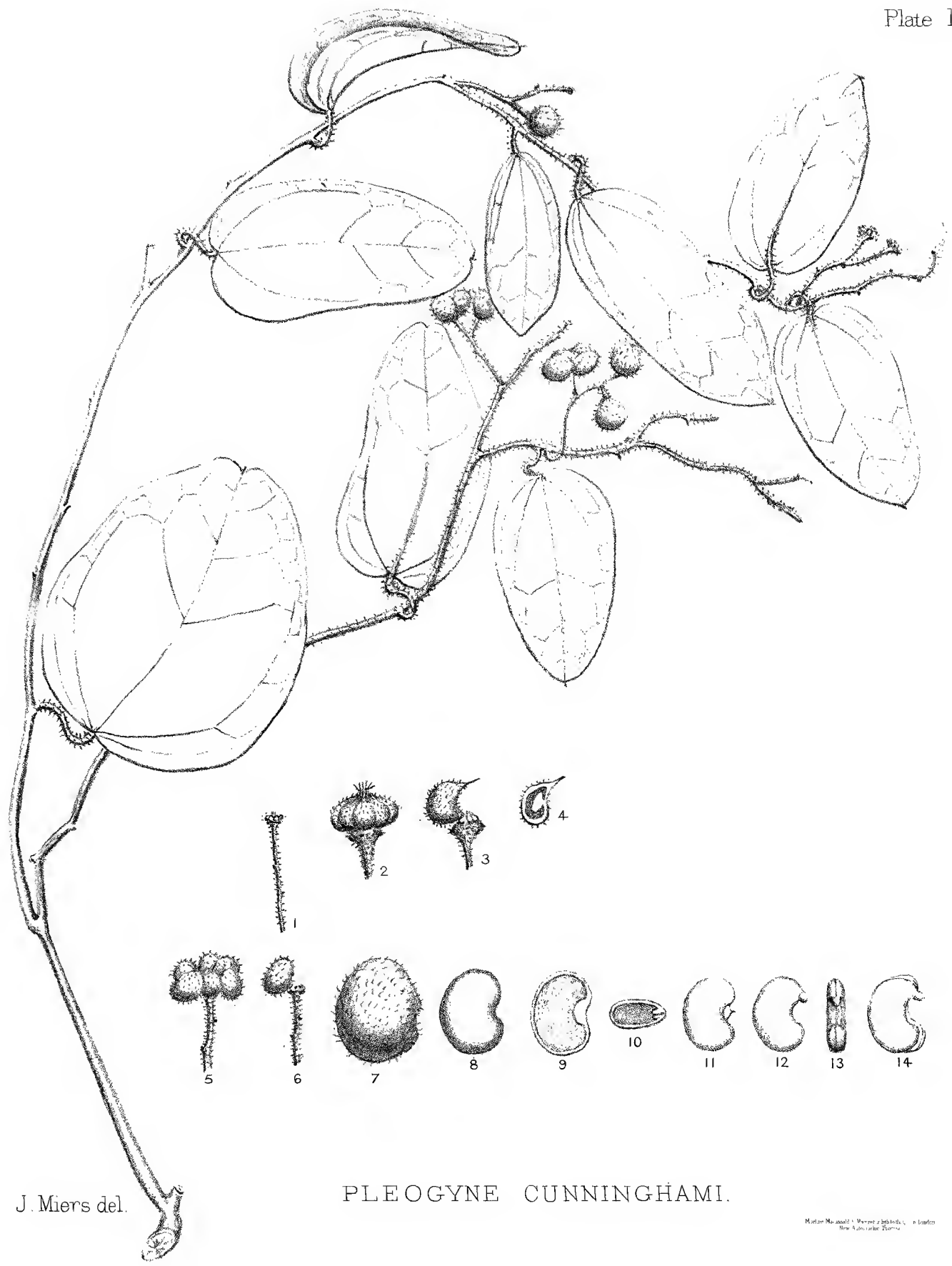


PACHYGONE

J. Miers del.

Printed by Messrs. J. & J. G. Smith, London.





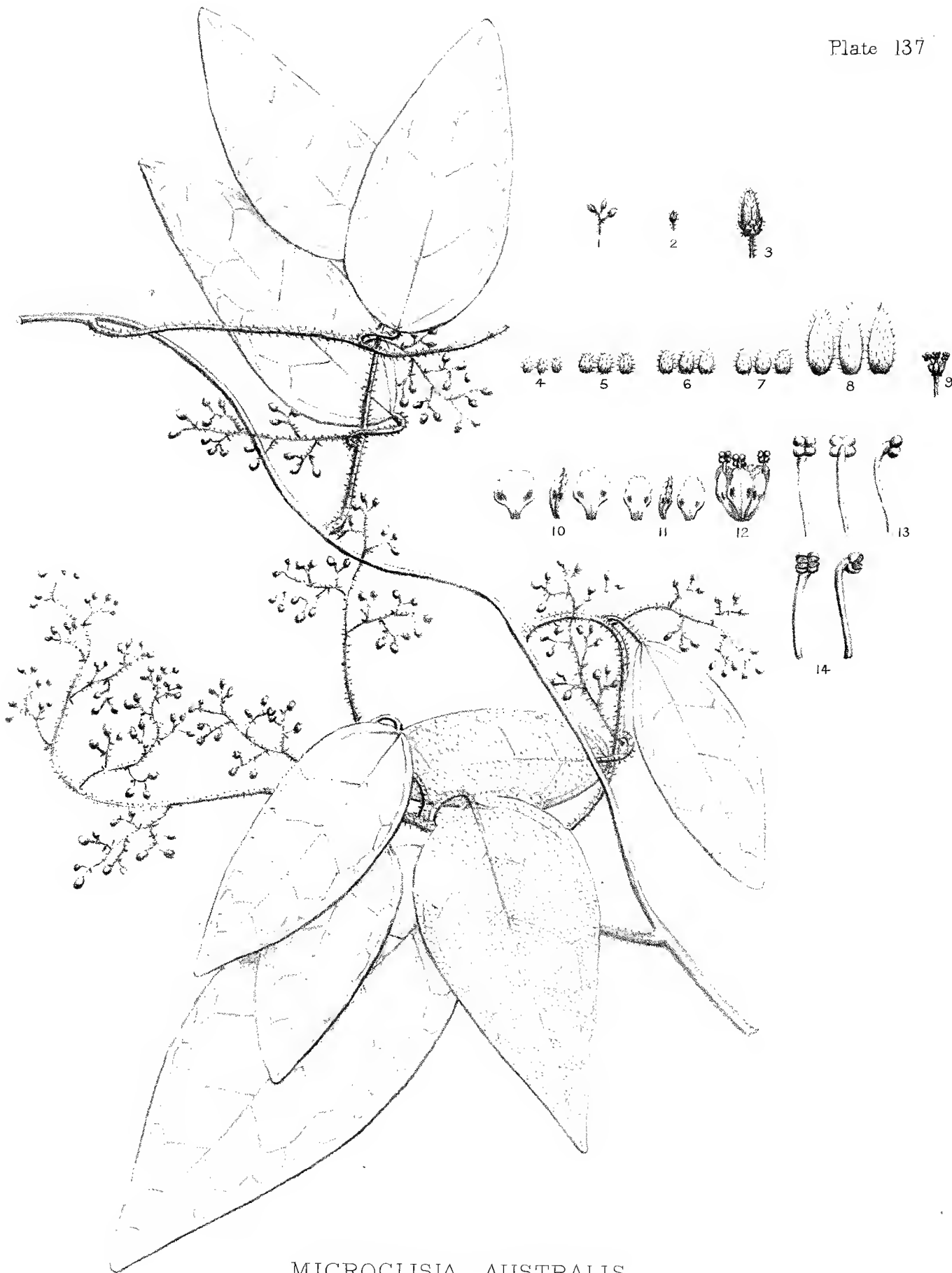
J. Miers del.

PLEOGYNE CUNNINGHAMI.

Milton M. Good & Mervyn Z. Beckwith, in London  
New South Wales, Australia



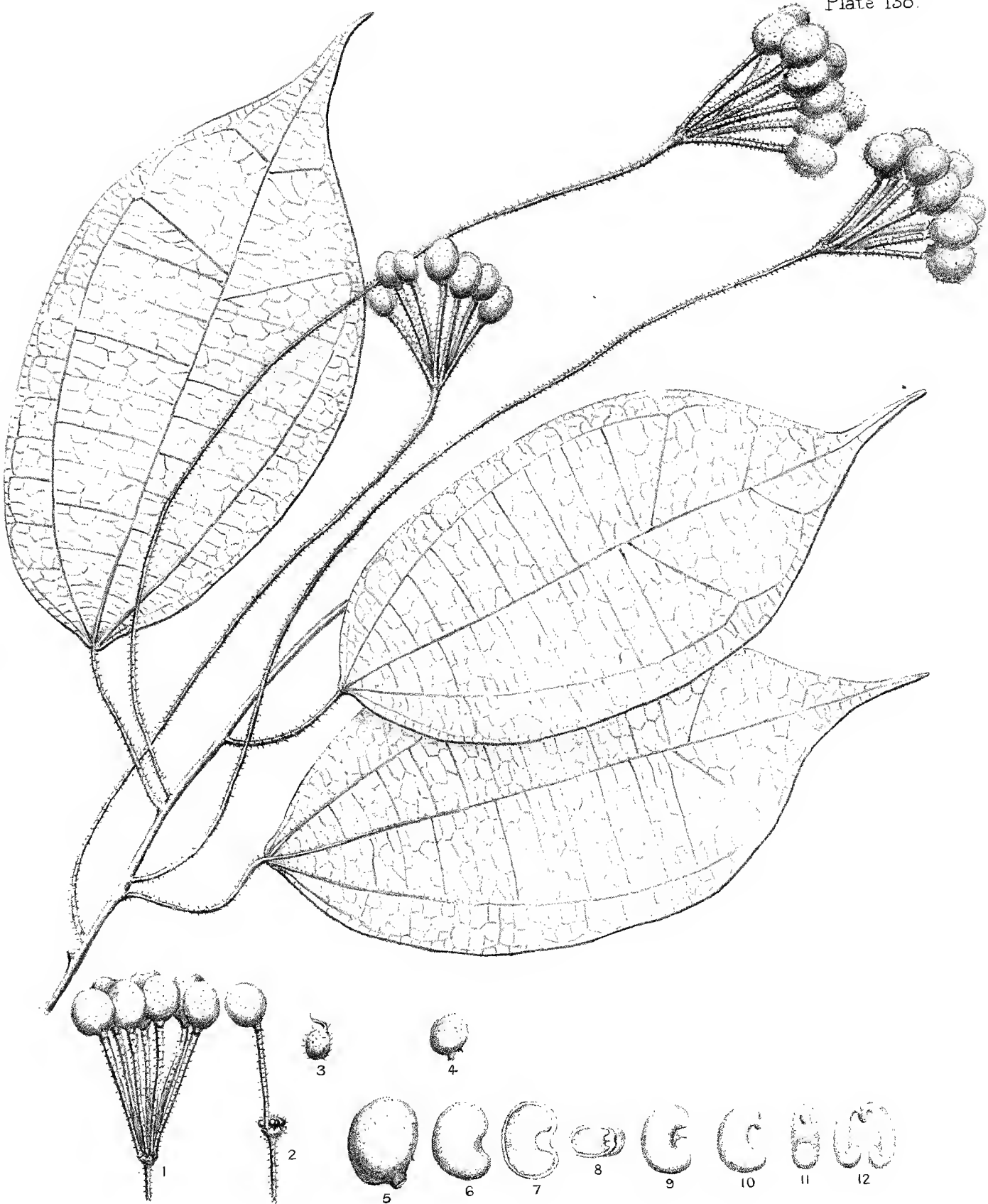




MICROCLISIA AUSTRALIS.

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SCIADOTENIA CAYENNENSIS

J. Miers del.



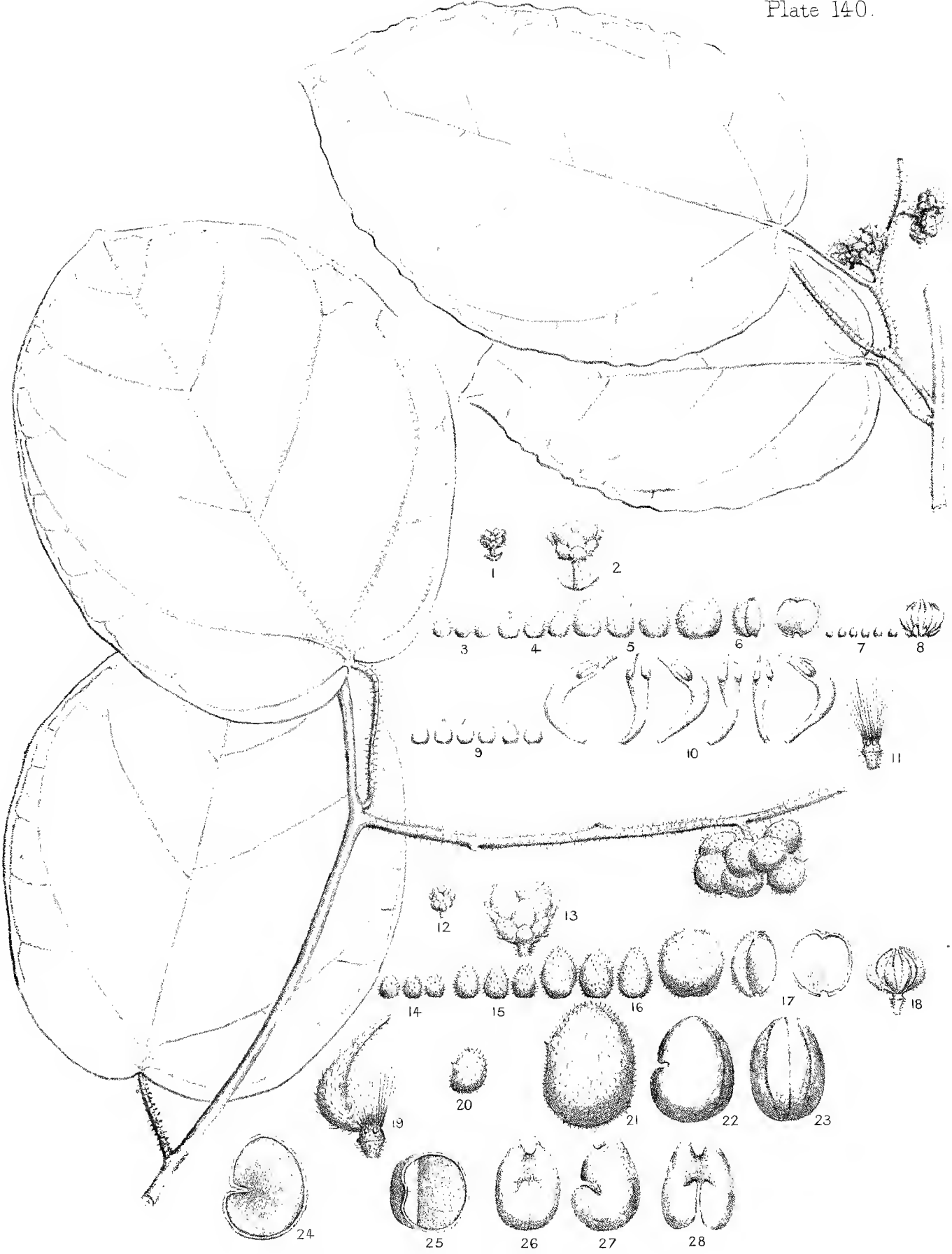


TRICLISIA PATENS.

J. Miers del.

11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.



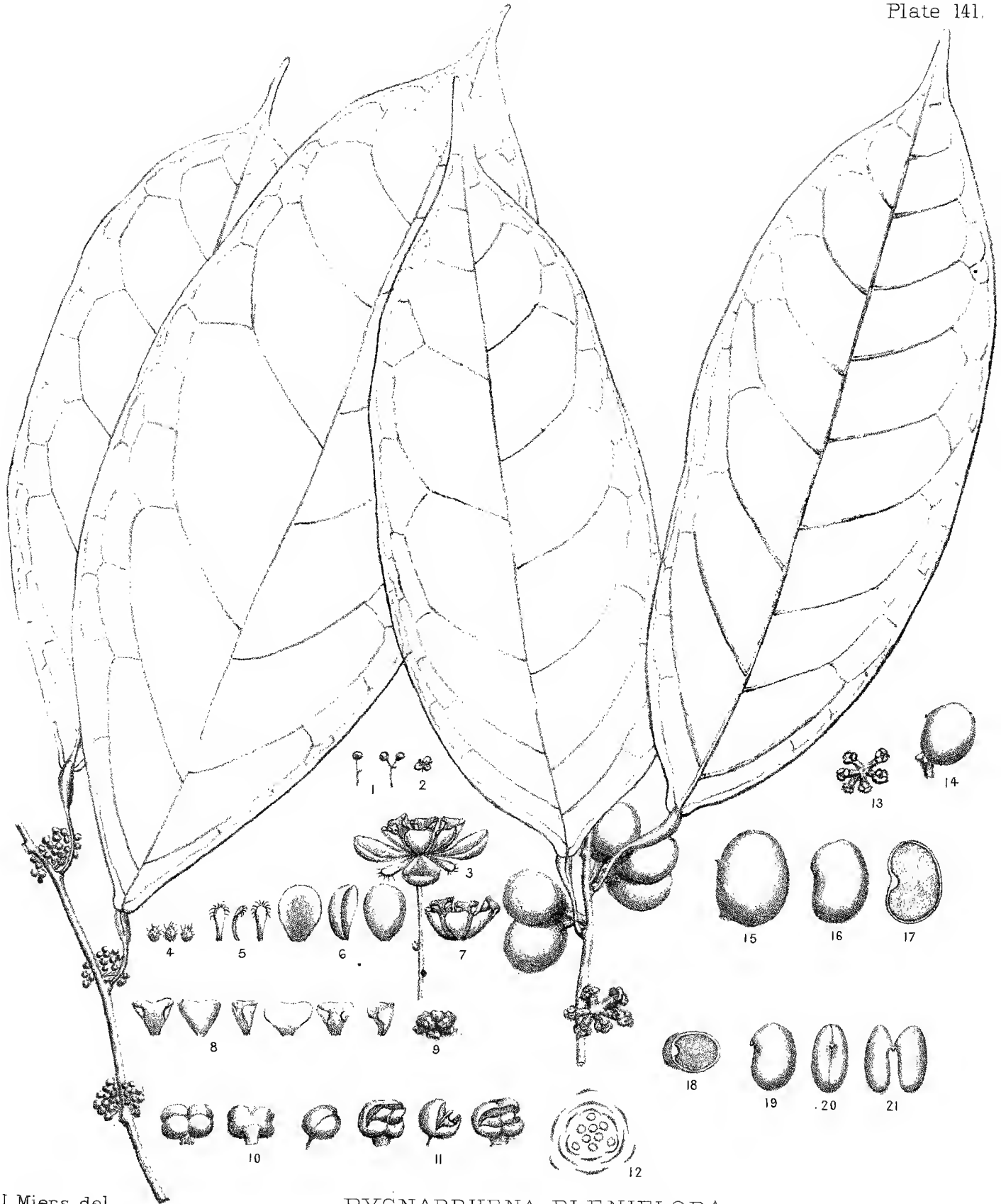


TRICLISIA SUBCORDATA.

J. Miers del.



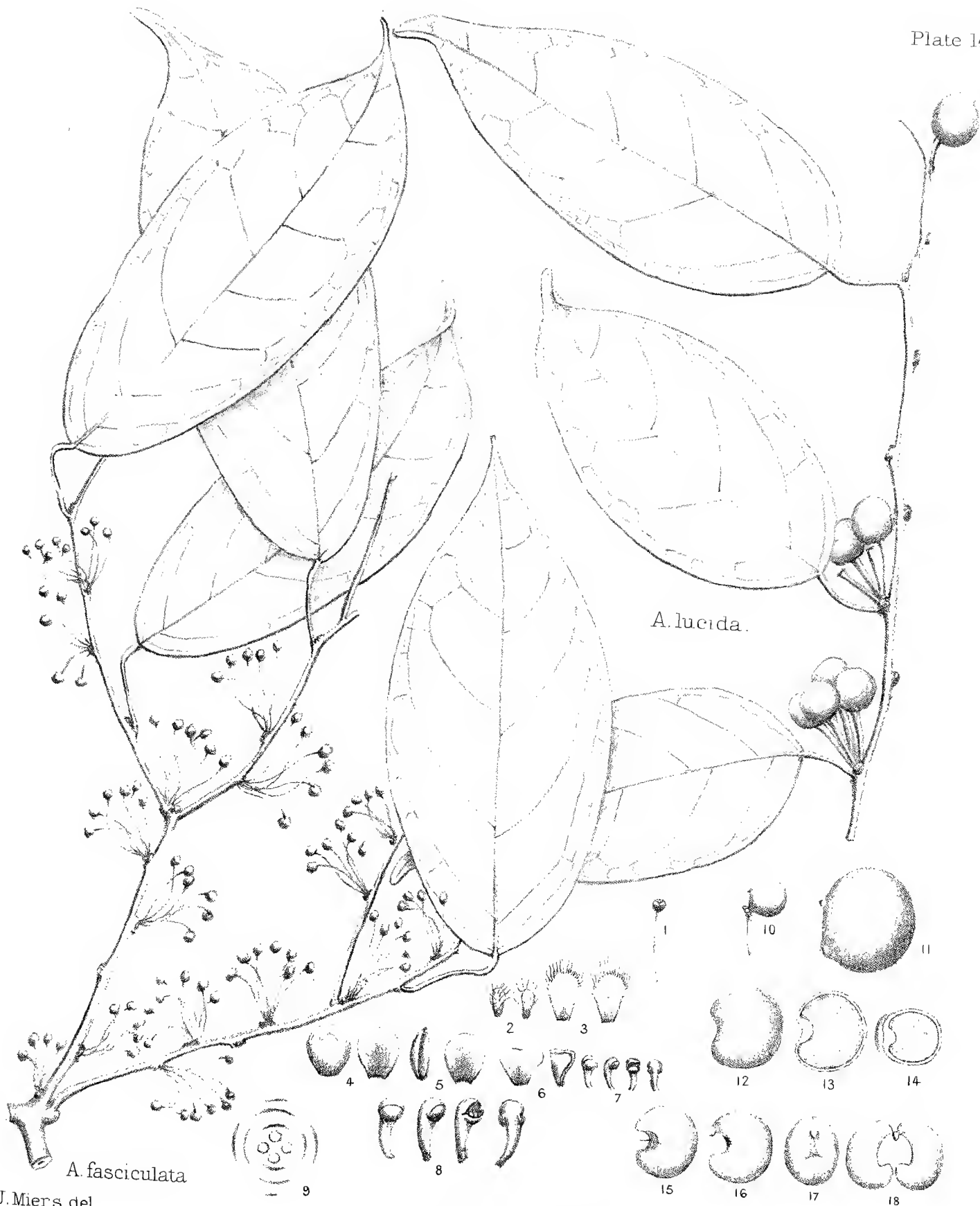




J. Miers del.

PYCNARRHENA PLENIFLORA.





*A. lucida.*

*A. fasciculata*

J. Miers del.

ANTITAXIS.

Printed and Published by J. Miers, 10, St. Andrew's Place, Singapore.





J. Miers del.

SPIROSPERMUM PENDULIFLORUM ♂





J. Miers del.

SPIROSPERMUM PENDULIFLORUM♀





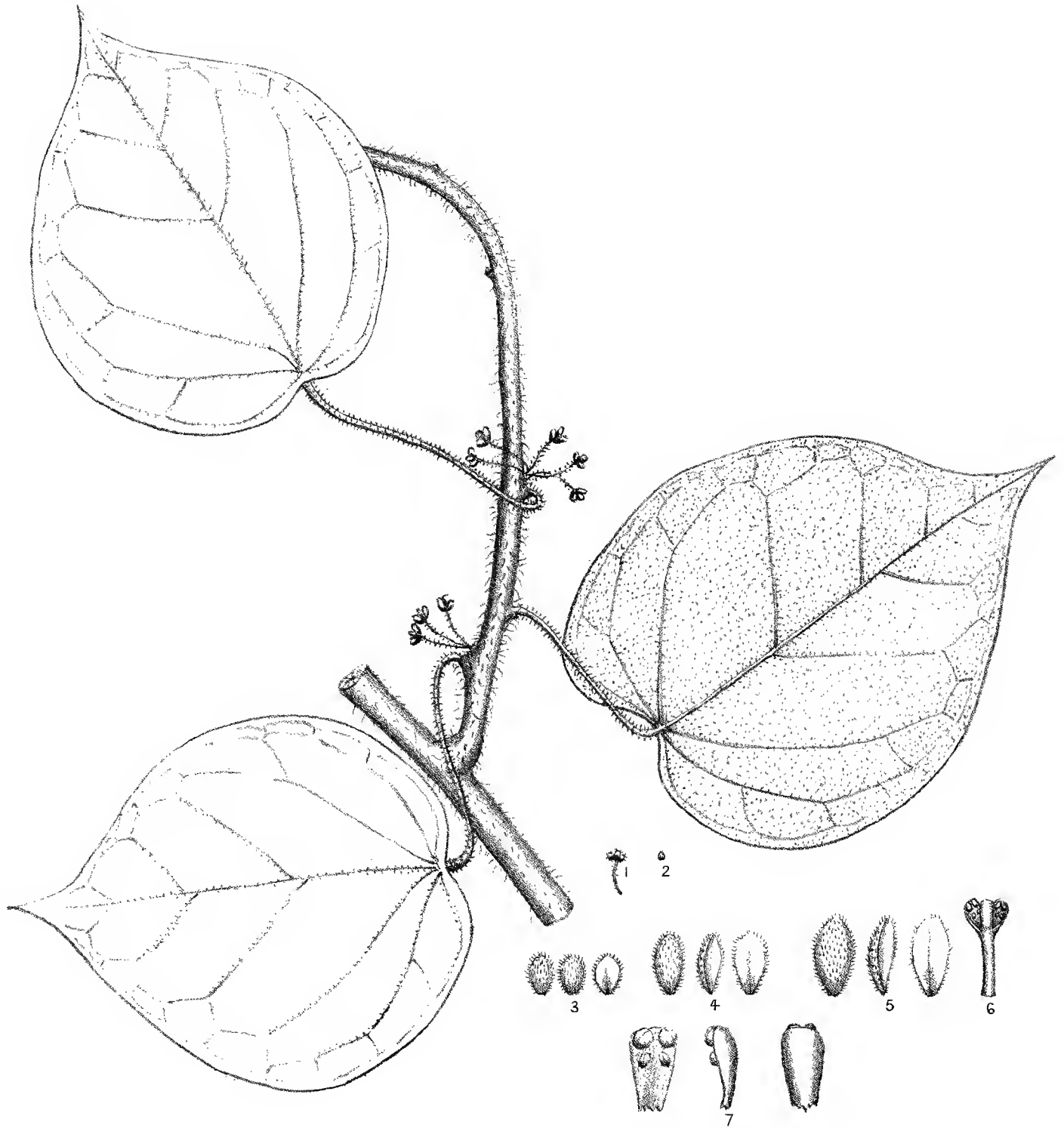


*D. latifolia*  
J. Miers del.

*D. ovata.*

DETANDRA.

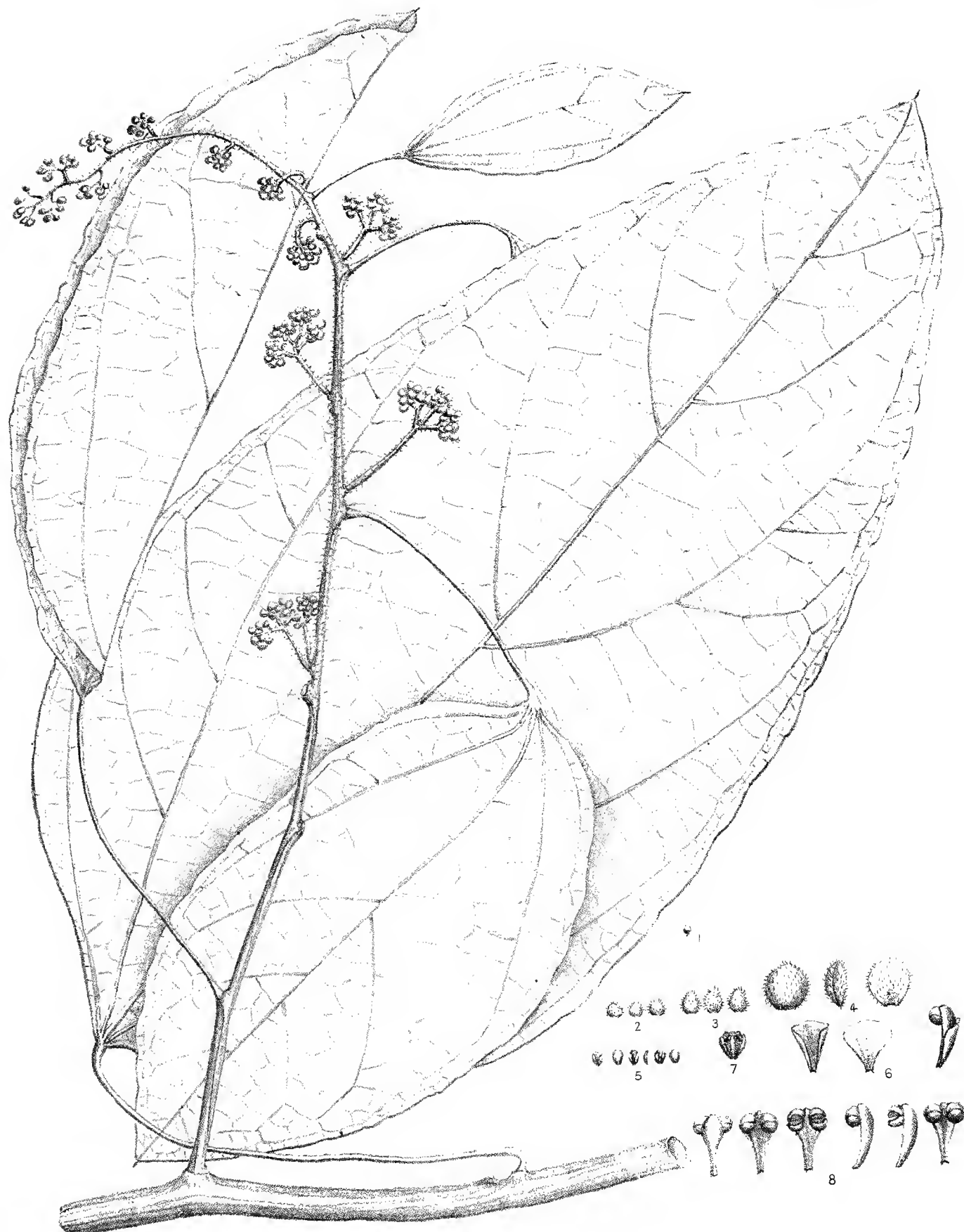




SYRRHEONEMA FASCICULATUM.

J. Miers del.

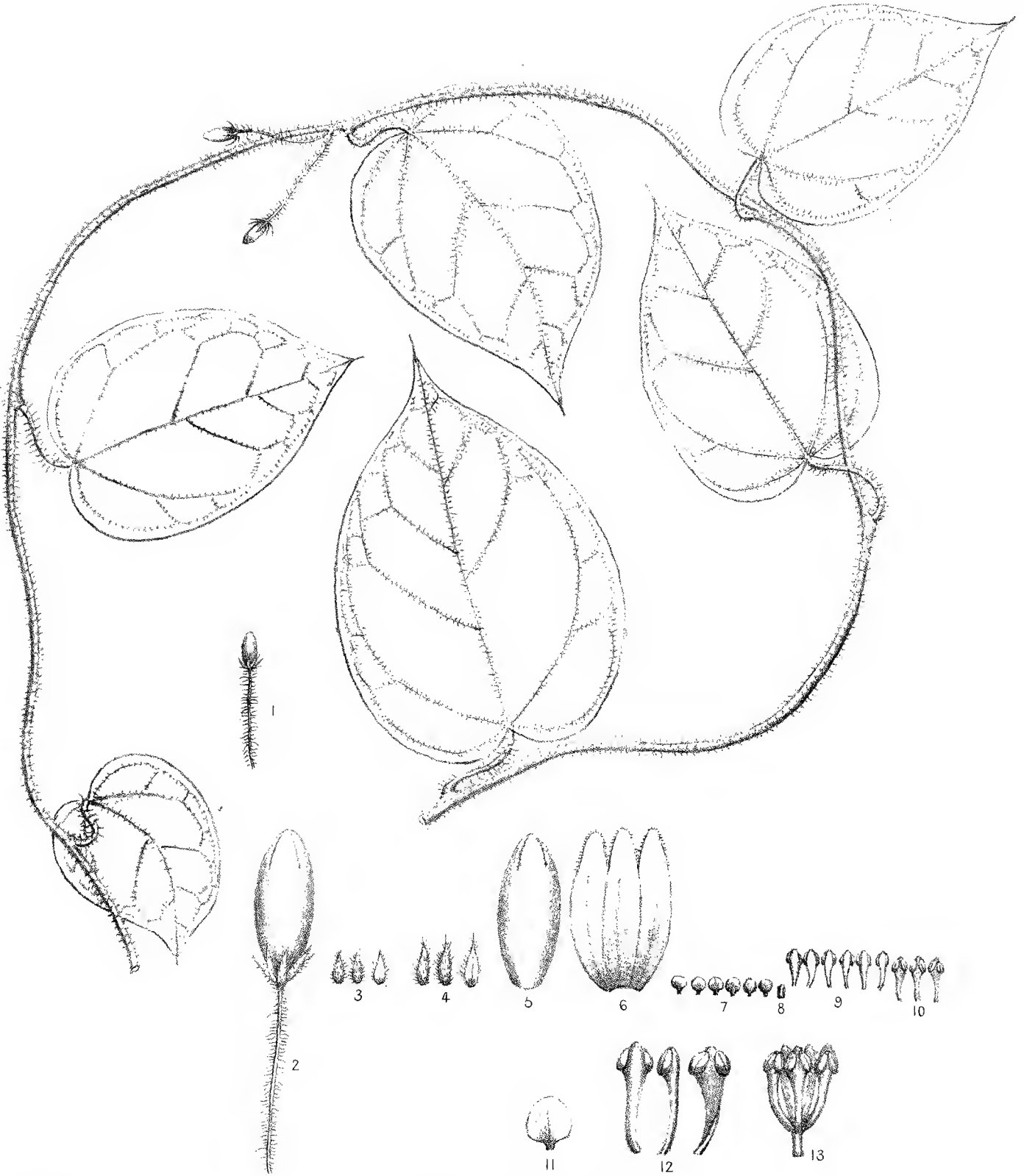




J Miers del.

ELISSARRHENA LONGIPES.





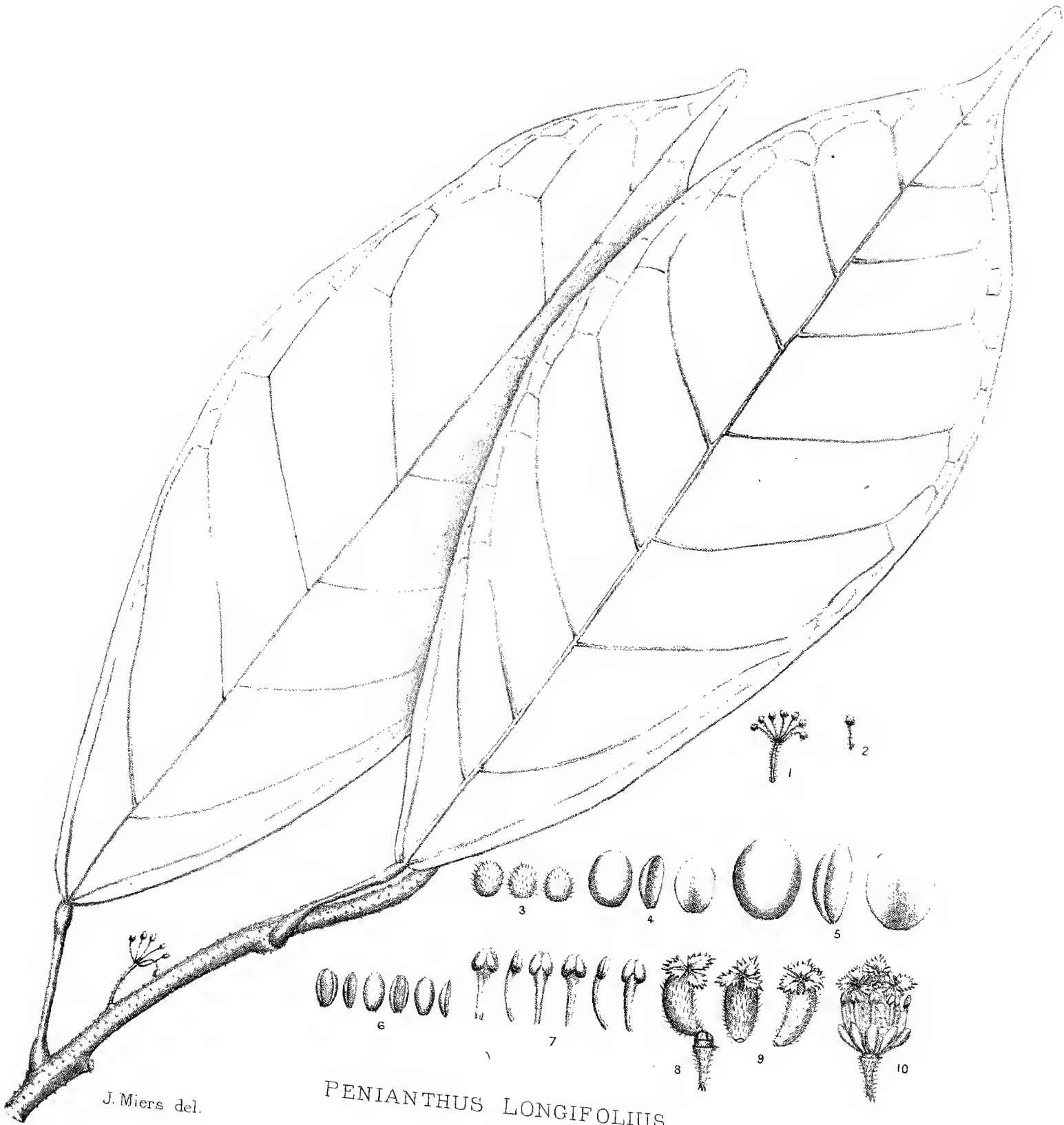
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SYNCLISIA SCABRIDA.

Miers, Miers, 1874, p. 22, t. 12, f. 12. The Queen's College, London. New August 1874.







J. Miers del.

PENIANTHUS LONGIFOLIUS.





J. Miers del.

SELWYNIA LAURINA.





J. Miers del.

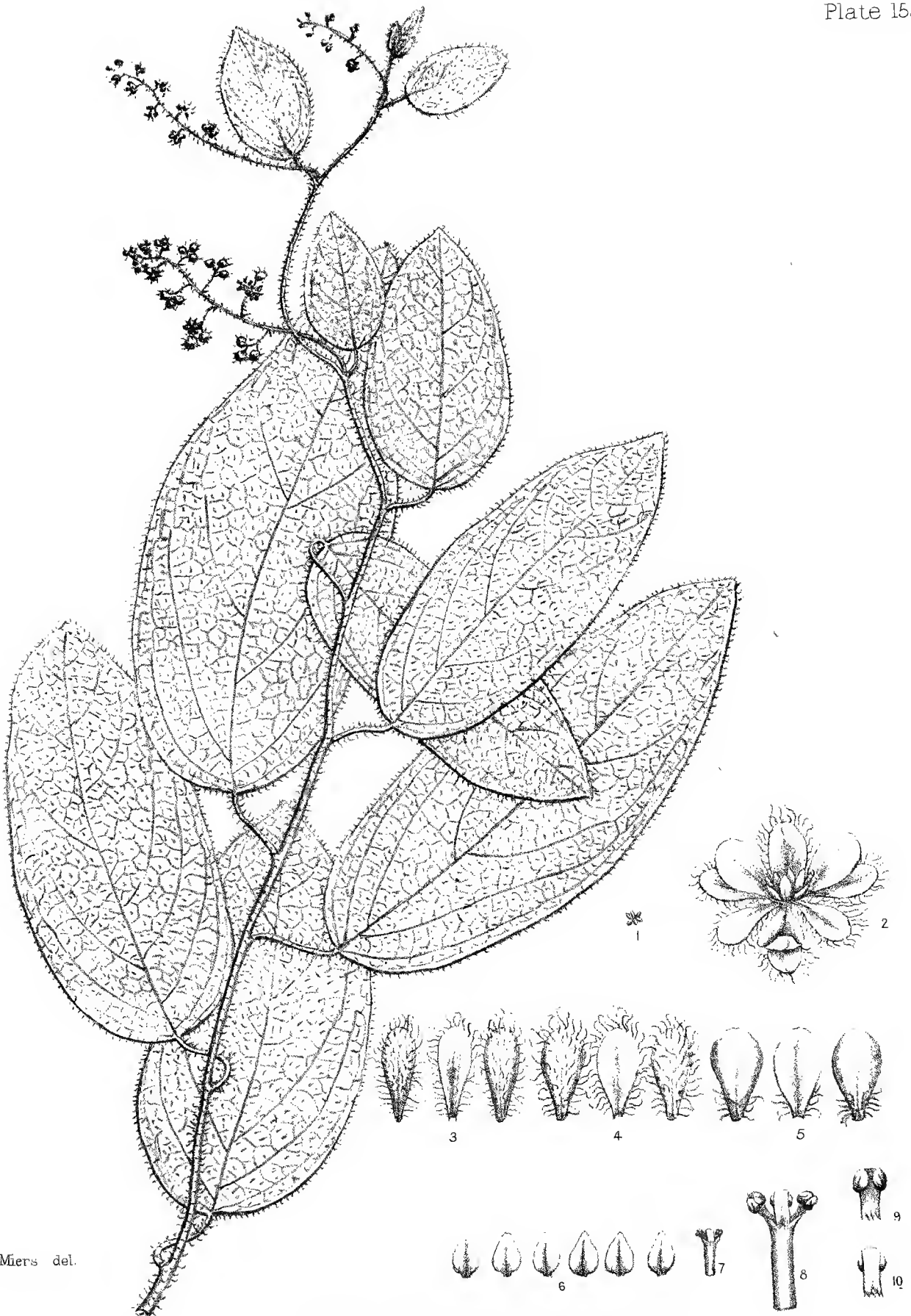
ARISTEGIA LAEVIGATA.







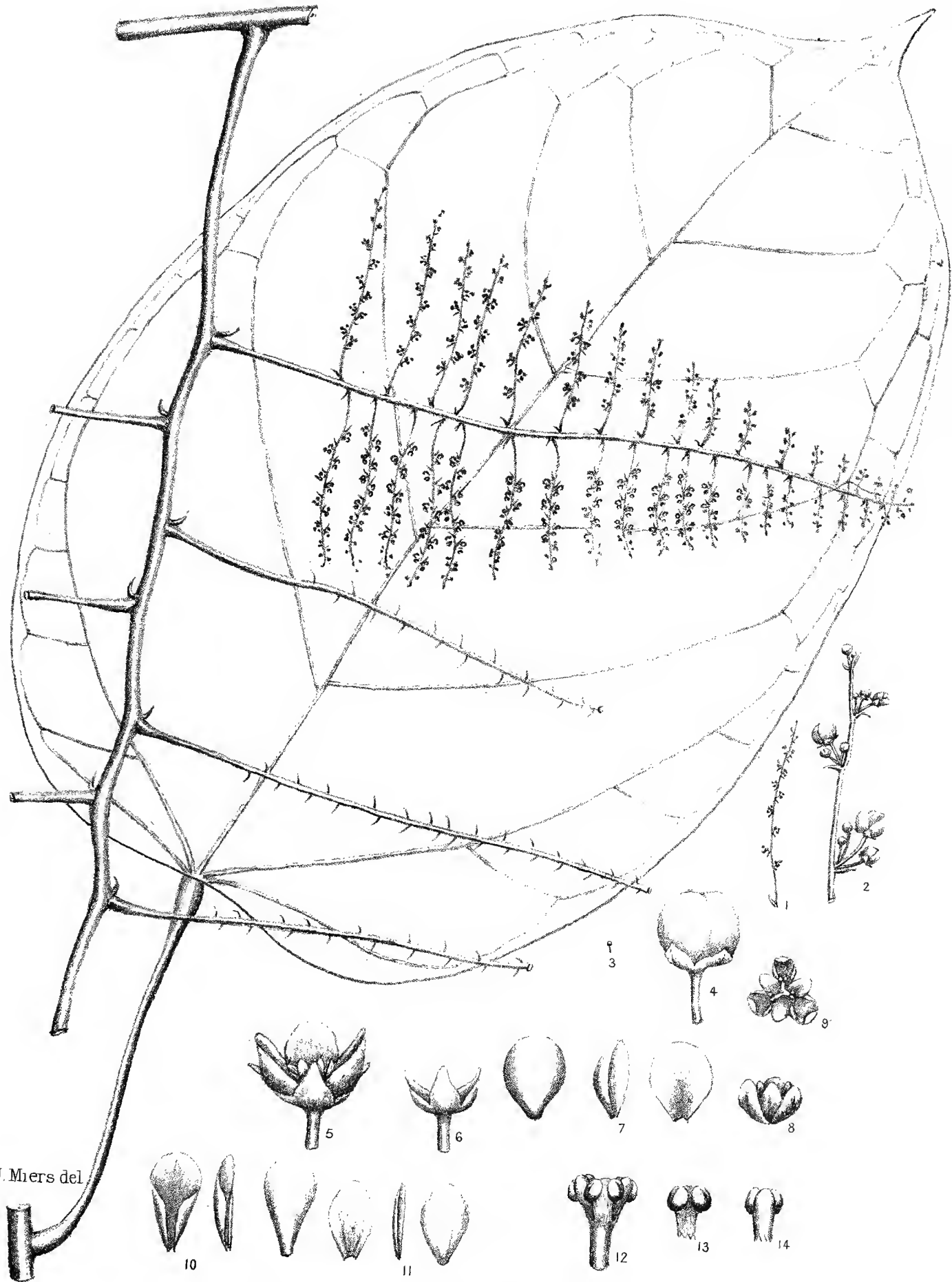




J. Miers del.

RHAPTONEMA CANCELLATUM.





J. Miers del.

SOMPHOXYLON WULLSCHLÆGL. II.











